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ROYAL AGRICULTURAL SOCIETY OF ENGLAND

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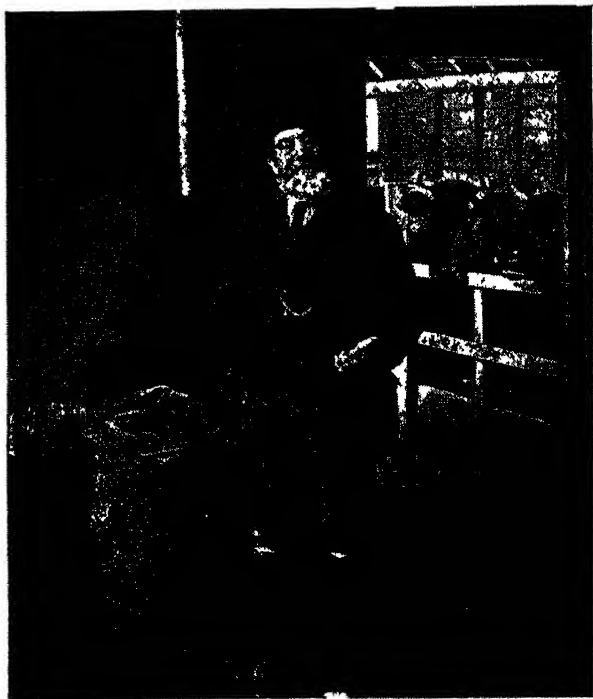
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THE JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND

THE USE OF LIME IN AGRICULTURE. MODERN ASPECTS OF THE PRACTICE

INTRODUCTION.

REFERENCE to the numerous published volumes of the Journal of the Royal Agricultural Society of England reveals the rather surprising fact that, during its long history and devotion to the many aspects of agriculture, it has never included a paper dealing exclusively with the question of "liming." This must not be taken to suggest, however, that there has been any lack of appreciation of the importance of the subject by either scientific or practical writers. In fact, there is probably no other subject to which such frequent reference has been made in papers dealing with all aspects of agriculture.

In the early days, just as at present, liming was regarded as being fundamental in successful farming practice. Unfortunately, with the post-war change in the economic conditions of agriculture, a farmer must needs be more careful than in the old days when lime was cheap and his profits were higher.

In the earlier part of the nineteenth century, when land reclamation and enclosures were fashionable, it frequently happened that dressings were often excessive even to the point of injuring the land and crops for some time.

John Watson, writing in 1845¹ on the reclamation of waste land in Westmorland, recommends, after paring and burning, a dressing of 5-10 tons of quicklime per acre, remarking that this quantity was much more moderate than the dressings usually applied in the South of England.

D. Macrae, writing twenty-three years later² on the reclamation of land in Northumberland, states that 5-10 loads per acre was a common dressing of lime to incorporate with the soil and turf.

¹ *Journal R.A.S.E.*, 1845, p. 79.

² *Journal R.A.S.E.*, 1868, p. 321.

When chalk could be obtained either by trenching or from local pits, it was customary to apply anything from 30–100 loads per acre, spreading the raw rock on the surface. Crumbling was usually rapid, alternate wetting and drying or frost reducing the material to a fine state of division.

Old agreements for leases frequently bound a tenant to apply 100 bushels (about 3 tons 15 cwt.) of lime per acre to his arable land every fourth year, that is, once in each rotation. In those days the price was 6*d.*–8*d.* per bushel, so that at the cost of 60*s.* per acre the annual charge on a farm having 400 arable acres would be about £300, a burden which could ill be afforded by the farmer of the present day.

A somewhat analogous treatment of land was the old method of marling which, judged by the number of marl pits still in existence, must have been a widely-spread and popular practice. The process was recommended for sandy and peaty land, and was held in high esteem as an improver in both cases. The method had the advantage of supplying both clay and lime, both of which, particularly in the case of light land, would be highly beneficial. In those days 3*d.* per cart-load was the usual figure for digging, carting and spreading the marl.

Charles Burness, writing in 1842¹ from Woburn, claimed that the effect of marling was to make the straw stronger, causing it to stand better in wet seasons, as well as to produce a better ear. About 50 loads was applied to the acre on the clover leys, or better still on the fallow for turnips in winter when the frost would have a chance to pulverise it.

It is interesting to note that the effects of this old practice can still be detected in many of the light sands of the Midlands. On the Harper Adams College farm there is one area where the top-soil contains 10 per cent. of clay and overlies a stratum containing only 2·3 per cent., showing that finer material introduced by marling has persisted over a long series of years. Further verification of this fact is shown by the top-soil on the same soil series but in the next field, having only 1·5 per cent. of clay.

Turning to the question of the action of lime on soils and crops, certain effects were well known to, and to some extent understood by, the older writers. A writer in 1852 stated:—

“the caustic properties of lime have the effect of bringing into immediate action the inert vegetable materials contained in the soil. Great crops have often been produced by its first applications and farmers have been led into the error of repeating the operation without other manures, whereby the land has become exhausted, instead of fertilised. So long as there is store of organic matter or humus in the soil lime will be an excellent manure.”

¹ *Journal R.A.S.E.*, 1842, p. 233.

J. T. Way, consulting chemist to the Royal Agricultural Society of England, writes in 1854¹ in an article entitled "On the Influence of Lime on the Absorptive Properties of Soils":—

"So recognised an agent in the hands of the farmer has this substance become that in leases granted for farm property it is not unusual to insert a clause for the purpose of regulating its application. And yet who among us can say that he perfectly understands the mode in which lime acts, certainly not the agriculturist himself, for although he sees what lime does, he cannot explain how it is done, and with equal confidence I would say that the conscientious chemist will not pretend to this knowledge. He may indeed suggest half a dozen ways in which lime affects vegetation, but they are only those which are referable to the known general properties of the alkaline earths. Lime sweetens the soil by neutralising any acid characters that it may possess, it assists in the decomposition of inert organic matter and therefore increases the supply of vegetable food to plants. For both these reasons it is a very valuable addition to peaty soils. Lime decomposes the remains of ancient rocks containing potash, soda, magnesia, etc., occurring in most soils; it at the same time liberates silica from these rocks. It is consequently a means of supply of important mineral food for vegetation. Lastly lime is one of the substances found uniformly and in considerable quantity in the ashes of plants; it is a necessary part of the plant's structure; and if it is deficient in the soil its application may be beneficial merely as furnishing a material indispensable to the substances of the plant."

Such, according to Way, were the usual reasons for liming given in the text books of that time.

In the same paper Way describes some of his well-known experiments, whereby he showed that although the presence of lime in the soil neither assisted in, nor interfered with, ammonia absorption, yet its application to the soil was responsible for a liberation of ammonia from that soil.

Such a list of virtues attributable to liming includes many of those which are well recognised at the present day, but this question will be dealt with in more detail at a later stage in this paper.

About that time, the middle of the nineteenth century, the use of artificial fertilisers (as well as guano, etc.) was beginning to obtain popularity, and the farmer discovered in them a quick acting and easily applied device for increasing his crops. In the prevailing ignorance as to the real significance of liming is it to be wondered at that the use of "artificial" should have come to be regarded as a "soft option" to the laborious and unpleasant business of liming?

A rather illuminating paragraph on the trend of thought at that time comes from the pen of Henry Tanner in an essay on the "Agriculture of Shropshire" in 1858.² Writing of the wheatlands in the Corve Dale he states:—

"The use of lime is certainly not so extensive as it was, many employing guano as a substitute. The experience of those who have done so is very strongly in favour of the same results being gained as with lime.

¹ *Journal R.A.S.E.*, 1854, p. 491.

² *Journal R.A.S.E.*, 1858, p. 1.

Can it be that the experience of these true men of practice is another instance of practice anticipating the discoveries of science and thereby adding some additional confirmation of the opinions expressed and the suggestions given by Professor Way in his valuable paper."

Tanner then goes on to quote Way's two opinions. Firstly, that the soil contains much ammonia thought to be absorbed from the air, and secondly, that the action of lime in the presence of water is to set free from the soil one-half of its ammonia content. He then draws the conclusion that lime acting as a liberator of ammonia is an equivalent for the use of ammonia manure. The evidence of this district (Wheatlands) was that the one might be considered as a substitute for the other.

Although lime undoubtedly does act directly and indirectly as a liberator of ammonia from the soil for plant use, the agriculturists of those days failed to realise that its other functions are even more important, and that lime and guano could not possibly be regarded as equivalent materials in their fertilising actions.

From this time (1860) onwards the practice of liming lost a great deal of its old popularity, but for a time the reserves in the soil built up by previous generations enabled the farmer without serious harm to his crops to make extensive use of the numerous manures coming on the market.

Even to the present day in many of our heavier soils the remains of those enormous early dressings still form reserves which the farmer has never found it necessary to replenish. In the lighter soils, however, more rapid removal by drainage caused serious inroads on these lime stores with the result that, by the end of the nineteenth century or shortly afterwards, large areas in the Midlands and other parts of the country, on which liming had long been abandoned, had become practically useless for growing such crops as are sensitive to acid conditions.

This widespread decline in the practice of liming, possibly stimulated by falling prices, was, however, by no means universal; on the contrary many districts still clung to the old precepts and customs, modified somewhat to meet economic exigencies and influenced to some extent by scientific pronouncements.

A writer in the *Encyclopaedia of Agriculture* (1908) states that towards the end of the nineteenth century it became customary to apply smaller quantities—5 to 20 cwt.—of ground lime per acre and most works became equipped with a grinding plant. Later (in 1907) ground limestone was first used and found satisfactory. It seems rather remarkable that ground limestone had not been produced earlier, since chalk, which is only another form of the same material, had been used from time immemorial. Possibly the reason may be related to

improvement in grinding, enabling a finer material to be produced, as well as to more satisfactory methods of power production.

The present position is that the practice of liming is once again gaining in popularity and more lime has probably been applied to the land in the past five or six years than in the previous part of the present century. At any rate this is almost certainly the case in the Midlands, the part of the country with which the writer is most familiar. To what precise causes this recrudescence of popularity is attributable is difficult to say, except that there can be little doubt that Agricultural Education has done much to acquaint the agricultural community with the facts and at the same time has succeeded in evolving better methods for determining the needs of the soil.

SOIL CONDITIONS AND THE NEED OR OTHERWISE FOR LIME.

The short historical résumé just given will lead the reader to conclude that liming has hitherto been practised largely as an art, and although many of its benefits and, in some cases, disadvantages had been observed, very little was really understood regarding its action on the soil and on the plant. On the other hand even since the early part of the nineteenth century, scientific investigators have been steadily working on the problem of elucidating the soil's constitution and attempting to solve many phases of its behaviour in relation to plant growth. It may justly be claimed that as a result much light has now been thrown on the whole subject. While admitting that many problems still remain, there is a much better understanding of those changes taking place in the soil, consequent on the process of liming. It is intended in the following part of this article to introduce to the reader some of the more modern views on the subject of liming and to explain the mechanism by which the change in the soil takes place. In order to do this it is necessary to explain some of the terms now in use.

FREE LIME.

The application of lime to a soil results in the formation of a store of free "carbonate of lime." No matter if it be applied in forms such as "quicklime" or "slaked lime" it rapidly changes to carbonate and, as such, forms a temporary or, if present in sufficient quantity, a more permanent reserve. It is a simple matter to test a soil for the presence of free lime by the application of a suitable acid, effervescence occurring if free lime is present. This is one of the oldest tests and is still useful in certain circumstances provided that it is carried out by someone sufficiently expert to realise its pitfalls.

ADSORBED OR EXCHANGEABLE BASES.

Since the classical investigations by J. T. Way over eighty years ago it has been known that forms of lime other than "free" must exist in the soil. He showed that the application to the soil of manurial salts, such as muriate of potash, sulphate of ammonia, etc., resulted in the manurial constituent of these substances being retained and equivalent amounts of lime liberated. Several theories advanced both by Way and later writers sought to account for this action, but only comparatively recently, *i.e.*, in the last twenty years, have apparently satisfactory explanations been forthcoming. It appears that not only the lime (or perhaps more correctly stated the calcium), but also many other manurial substances such as potassium, magnesium and ammonium are held in a state of loose combination by the soil. They are in loose combination in the sense that, while they cannot easily be washed out of the soil by water, they fairly readily become available as plant foods. These loosely-combined substances are usually referred to as "adsorbed" or "exchangeable bases" and if present in considerable quantity prevent the soil from being acid. It is known that they are held by the very fine material present in the soil—the so-called colloidal material or "soil colloids." These soil colloids are almost entirely composed of the clay and the humus of the soil. From the practical point of view the retention of manures and lime in the loose state of combination is associated with the clay and humus of the soil, a point of no small significance to the farmer. In most soils the adsorbed lime is considerably in excess of the other bases and forms about 80 per cent. of the total present.

ACIDITY AND ALKALINITY.

In order to gain a clearer mental picture of the way in which bases are held by the clay and humus the reader is referred to Fig. 1.

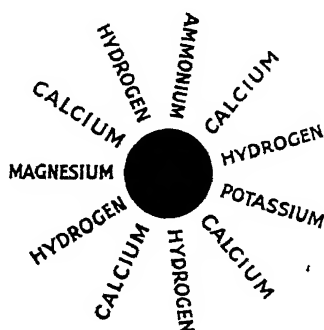


FIG. 1.—Colloidal particle with loosely attached manurial materials.

The particle is, of course, for the purpose of illustration, enormously enlarged and shown to possess basic materials, ammonium, potassium, magnesium, and calcium attached. These basic materials held in this way are collectively referred to as "ions."

It will be noticed that, in addition to the basic ions, another—the hydrogen ion—is present also. This is acidic in nature.

Following this description it is possible to describe in more accurate terms just what is meant by an acid, a neutral and an alkaline soil.

An "acid soil" is one in which there is a preponderance of hydrogen ions to basic ions and the degree of acidity will depend entirely on the relative quantities of each. Should the quantity of hydrogen ions greatly exceed that of the basic ions, the soil will be very acid. Should the numbers be in only slight excess the soil will be only slightly acid.

An "alkaline soil" is one in which the quantitative effect of the basic ions exceeds that of the hydrogen ions.

A "neutral soil" is one in which the effects of the two classes balance.

The condition of acidity or alkalinity obtained in a soil is referred to as its "Reaction."

EXPRESSION OF ACIDITY—pH NUMBERS.

In the foregoing description, the condition of acidity in a soil has been ascribed to the presence of hydrogen ions and the "degree of acidity" experienced is a reflection of the numbers present. An appropriate scale to represent their concentration is called the pH scale and is shown diagrammatically in Fig. 2.

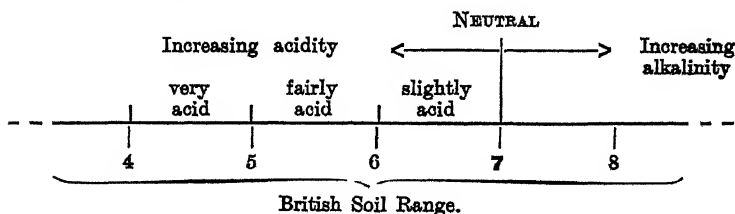


FIG. 2.—pH scale showing range of soil acidity and alkalinity.

Neutrality is expressed by the pH number 7.

Increase in either acid or alkaline conditions will be represented by numerical decrement or increment respectively on either side of neutrality, viz., pH 4 is more acid than pH 5 and pH 9 more alkaline than pH 8.

LIME REQUIREMENT.

This term refers to the quantity of lime necessary to bring an acid soil to a state approximating to neutrality. Its practical aspects are more appropriately discussed at a later stage in this article.

RELATIONSHIP BETWEEN THE "ACIDITY," "LIME REQUIREMENT," "ADSORBED LIME" AND "FREE LIME."

There is a fairly close relationship between these various soil conditions and this can perhaps best be shown by reference to analyses from a liming experiment in progress on the Harper Adams College Farm. In this experiment a number of plots on a rather acid soil received varying quantities of lime in March 1928. Each year the soil from the plots is sampled and certain analyses, shown in Table I, are made.

TABLE I.

ANALYTICAL DATA FOR FOUR PLOTS IN LIMING EXPERIMENT AT HARPER ADAMS COLLEGE.

PlotNo.	Cwt. per acre Carbonate of Lime applied 1928.	Acidity (pH) 1932.	Adsorbed Lime (CaO) per cent. 1932.	Free Carbonate of Lime per cent.	
				1929.	1932.
2	0	5.05	0.056	Nil	Nil
3	25	5.57	0.094	0.012	Nil
4	50	6.12	0.132	0.041	Nil
1	100	6.75	0.159	0.138	0.034

Referring to the fifth column, it will be seen that the first effect of applying lime was to lay up substantial reserves of free lime in the soil. Gradually these reserves have changed from the "free" to the "adsorbed" state, as shown in column six, except in the plot receiving the highest dressing where 0.034 per cent. still remains. Increasing initial dressings of carbonate of lime have resulted in the present increased stocks of adsorbed lime. At the same time the acidity has diminished as is shown by the increase in the pH figure from 5.05 to 6.75.

There is, therefore, a fairly close relationship between the "reaction" and amount of "exchangeable calcium" present in a soil. This relation only holds good, however, when making comparisons between soils of a similar nature.

A similar relationship between the lime requirement on the one hand and the degree of acidity and the adsorbed

calcium on the other also holds, but the figures for this are not given in the table.

Reference to Table III (p. 15) shows the yields of corn and roots over a period of four years on these plots. Apparently the adsorbed lime can supply the crop's need for calcium as well as control acidity. In a case such as this the old test for lime, by adding acid to a soil, is unable to say if a dressing is needed since the absence of free lime does not necessarily indicate the presence of acid conditions. On the other hand, the presence of free carbonate must not always be taken as a guarantee of absence of acid conditions. Reference to this condition is made later. A non-acid soil may be considered as having one or both of two lime reserves; free and adsorbed. Free lime, as long as it is present in sufficiency, will tend to keep up the store of the adsorbed lime.

DEGREE OF SOIL ACIDITY AND EFFECT OF LIMING.

Since a description of the more fundamental aspects of soil acidity is beyond the scope of this article, suffice it to say that the pH range usually found in British soils is from 3.5-8. On the whole agricultural crops have adapted themselves to grow in a pH range of about 3.8-8.0.

It is now possible to follow the course of events resulting from a generous application of, say, quicklime to an acid soil. The first effect will be for some of the lime to dissolve in the soil water with the result that the adsorbing colloids are bathed with calcium ions. An exchange takes place, calcium being adsorbed, acid hydrogen ions set free and these latter being in turn neutralised by the lime in the soil solution. Adsorption will go on until a balance is reached, the soil meanwhile becoming at first neutral and later slightly alkaline, with a possible pH of 7.5-8. Any excess of lime is fairly rapidly converted into carbonate of lime, in which condition it merely forms a reserve.

"SOURNESS" AND SOIL ACIDITY.

The term "sour" as applied to soils is frequently used by the agriculturist and is usually accepted as meaning that crop growth is unsatisfactory and liming necessary. In many respects it would be better if the term sourness could be dropped, as it is really one of several ill-defined words in agricultural use. Usually the term is applied to soil acidity, but the writer has had instances of "sourness" shown to him where the soil was far from acid and the cause of the trouble was waterlogging. Another instance of its use occurs when it is said that rabbits cause a sour condition of the soil.

It is more likely that this is a state of temporary toxicity probably induced by the urine of the animals. Some people regard the term sour as meaning the absence of calcium as a plant food. There is therefore no definite condition of the soil which the term "sour" specifically defines. Soil acidity on the other hand is a definite condition capable of measurement and accurate description.

PLANT GROWTH AND ACIDITY.

Toxic Conditions Due to Acidity.

The most serious toxic effect arising in an acid soil must be regarded as being due to the presence of excess hydrogen ions, in other words, to the true acid condition itself. But, associated with a high degree of acidity, other factors, also of a toxic nature, manifest themselves and are believed to play a rather important role in inhibiting plant growth. For example, as acidity increases soluble aluminium salts begin to appear in the soil water, until at pH 4.5 they reach an amount that begins to cause injury to growth. On the other hand in neutral or only slightly acid conditions this factor is absent. Again, the low lime content of the soil occurring under acid conditions may, in some cases, result in a condition of calcium starvation of the plant.

When plant failures take place under acid conditions, three possible causes may be contributing :—

1. Toxicity of hydrogen ions (true acidity).
2. Toxicity of aluminium salts in solution.
3. Shortage of calcium as a plant food.

In the writer's opinion the first is undoubtedly the most frequent cause of trouble. The second condition, *i.e.*, aluminium toxicity, is held by some investigators to be important, while others consider that it causes little trouble except possibly in the case of barley.

The third condition, *i.e.*, shortage of calcium as a plant food, may account for a few instances of failure, but in the writer's opinion is probably seldom the cause of trouble among ordinary cultivated crops where manuring is adequate, since the crop needs for calcium are small.

Laboratory Diagnosis of Soil Acidity.

Numerous methods are in use and much ingenuity has been displayed by investigators in their development.

"*Colour Indicators.*" One of the most widely used methods is that in which a solution of a dye is employed to show colour graduations varying with the different degrees of acidity. For slightly acid soil Bromo-thymol-blue is suitable. For soils of a

more acid nature, Bromo-cresol-green, Bromo-cresol-purple, etc., may be used. For rapid, but less accurate, field diagnosis a mixture of Methyl red and Bromo-thymol-blue is employed and gives a range from pH 4.5-7.5. A word of warning is necessary on the use of these mixed indicators by any but those skilled in their use and who really understand them. As a rough guide they are excellent but beyond this they should not be expected to provide information. Should a field soil prove on the acid side to the mixed soil indicators, a sample should be taken and submitted for further investigation. Any attempt to advise the amount of lime necessary from the tint obtained is unsound practice and to be condemned.

Electrometric Determination of Soil Acidity.

Under strictly regulated conditions the indicator method can be used to give accurate results, but on account of certain difficulties most investigators prefer to use rapid electrical means of determining the pH values of the soil.

Effect of Varying Degrees of Acidity on Plant Life.

On examination the majority of soils will be found to have a reaction on the acid side. Exception must be made for those soils which are developed on the chalk, for those developed on some of the softer forms of limestone and also for those containing a good reserve of lime due to previous liming.

Plants, both agricultural and otherwise, can be roughly divided into several groups according to their natural adaptability to grow under (1) strongly acid, (2) moderately acid, (3) slightly acid or (4) alkaline conditions.

In the first group will be found such natural plants as heather, bilberry, bramble, rhododendron, spurry (sometimes called mountain flax, dither, dother, yarr, etc.), sour dock or sheep's sorrel, various grasses (as *Nardus* and some fescues), and such agricultural plants as potatoes, rye and oats.

In the second group may be found numerous wild plants and such agricultural plants as wheat, kale, swedes, turnips, ryegrass, wild white clover, etc.

In the third group are found many wild plants and various agricultural crops such as mangolds, sugar beet, barley, carrots, red clover and peas.

In the fourth group will be found lime loving plants (commonly found on chalk and limestone formations) such as guelder rose, scabious, burnet and others. Of agricultural plants sainfoin and lucerne may be mentioned.

Many plants will tolerate a range of reaction conditions sufficiently wide to bring them into more than one of the above groups.

Field Indicators of Acidity.

Numerous plants have been cited by investigators as indicating acid soil conditions. In arable fields sour dock and spurry are the two most definite indicators, but only if growing in profusion and to the exclusion, either partial or complete, of the more sensitive agricultural crops. In this connection it is interesting to note that both plants may continue to grow after liming, but much less profusely than under acid conditions.

Under grassland conditions it is very difficult to say definitely whether liming is likely to be beneficial or otherwise except on the millstone grits of Lancashire, Yorkshire, etc., and on some of the other light sandstones found in various parts of the country. A matted sole and the association of some of the fescues with Yorkshire fog, bent, etc., probably indicate acid conditions. For further information on the conditions of acid grassland the reader should refer to such works as *Grassland*, by Stapledon and Hanley.

Further, the need for lime on grassland may be observed in the rate of the development of bone in young grazing animals, and conditions of health and disease generally. This aspect of the whole subject is engaging the attention of investigators at present. Although much has been done, some time will elapse before the problem is sufficiently advanced to say with certainty whether liming is desirable or not in this connection. To the experienced eye the appearance of sensitive agricultural crops is a very useful guide to the soil's need for lime or otherwise. Stunted and poor growth, of course, may result from the operation of various adverse factors, of which acidity is only one. Absence of adequate plant food, waterlogging, checks in early stages by pests, etc., may all result in a somewhat similar appearance.

The Sugar Beet and Mangold crops are excellent indicators. Usually the crops grow normally until hoed but after that stage growth practically ceases and the plants assume a wizened or stunted appearance, and remain rather pale in the leaf. Root development is partially checked and many plants die altogether. Under conditions of extreme acidity the plants may not even reach the surface of the soil and a large mortality takes place immediately following germination. The failure of the crop usually allows weeds to grow and sour dock and spurry will tend to smother such plants as persist up to that point. Patchiness of the crop, not only on sugar beet, but on other crops as well, is an associated feature, since the soil is never uniformly acid. So marked is this characteristic that good plants will frequently be found growing only a yard or two away from the affected areas.

Barley and Wheat Crops. Excessive acidity results in a

rapid diminution of the crop and patchiness is always evident. Root growth is inhibited and in barley a restricted and dark coloured root is fairly strong evidence of lime shortage.

Turnips, Swedes and Kale. In extreme cases there is inability to make proper growth, and on the larger plants a curious greyish-white mottling of the leaves occurs. These blotches are more evident in some seasons than in others and may be associated with meteorological and nutritional disturbances not well understood. They have only occasionally been observed by the writer on affected plants.

Potatoes. It is seldom that the effect of severely acid conditions can be seen on potatoes, for the reason that, except when grown on acid land recently reclaimed, they are planted on soils which have at some time or other been limed. The only good instance in the writer's experience was on recently reclaimed virgin heath land at Chartley Park, in Staffordshire. There the land had just been ploughed, lime applied and potatoes planted. Over the bulk of the field the crop was distinctly good, but at the corners where the lime drill had left a little soil untouched the potatoes were stunted. Soil analysis showed the exceptionally low pH figure of 3.8.

Clovers. Red clover is probably the most sensitive of all the commonly grown agricultural crops and failure to reach the seedling stage frequently happens under very acid conditions. Under conditions of somewhat lower acidity the plant subsists longer and then dies out. Wild White Clover can withstand much more acidity than the other clovers, and no doubt this fact, coupled with its resistance to disease, accounts for its distribution over a wide range of soil reaction.

Critical acidity point for Crop Failures.

For some time past the writer has been collecting data in the field in order to determine the point ("Active Acidity" or pH) at which the various crops fail. The results of very many measurements and comparisons have yielded information which has been of immense value in advisory work connected with liming.

Table II shows the figures obtained :

TABLE II.
CRITICAL pH VALUES AT WHICH AGRICULTURAL CROPS FAIL.

Red Clover	5.7
¹ Carrots	5.5
Sugar Beet and Mangolds	5.3
Barley and Mustard	5.2

¹ More data are needed for this crop.

Wheat	5.1
Swedes	4.9
Parsnips, Cabbage, Cauliflowers and Savoy's	4.8
Kale	4.5
Ryegrass	4.3
Oats	4.2
¹ Potatoes and Rye	3.8

It is possible that the point of failure is not a clear-cut value, varying slightly with different soil and other conditions. This is a matter which needs further investigation.

AMOUNT OF LIME TO APPLY TO A SOIL.

Liming Experiments.

Having discovered from the behaviour of growing crops, and by subsequent examination of the soil in the laboratory, that acid conditions exist, it is then necessary to determine the amount of lime needed to correct the trouble. From the close relationship of the quantity of clay and humus to the adsorbing capacity of a soil it follows that for a series of soils of a given pH value, the amount of lime needed will vary with the content of these two constituents. The higher the clay and humus content, the larger will have to be the dressing in order to effect the same diminution in acidity. Numerous methods have been advocated by different workers, but that in commonest use in this country is that devised by Hutchinson and McLennan.² The method consists in substance of shaking a soil with lime (calcium bicarbonate) and making a determination of the amount used up by the soil. It will be found that the soil has been reduced approximately to neutrality during the experiment. The application of such laboratory data to the field problems has been, and is being, studied at numerous centres.

It is usual in this country to state a lime requirement figure in cwt. of carbonate of lime per acre, or in the percentage of carbonate required. The equivalent dressing in quicklime can be calculated on the basis that 100 parts of carbonate of lime are equivalent to 56 parts of quicklime.

In March 1928 the writer and his colleagues laid down a liming experiment at the Harper Adams Agricultural College with the object of testing the validity of the lime requirement figure in practice. The chosen soil, on the Bridgnorth Series (Bunter Sandstone), had a pH figure of 4.7-5.0 and a lime requirement of 40 cwt. of carbonate of lime per acre. Treatments of 0, 25, 50 and 100 cwt. per acre were given and each one was repeated four times. The lay-out of the plots was a 4 x 4 Latin square, as seen in Fig. 3 :

¹ More data are needed for these crops.

² *Journal of Agric. Science*, 1915, Pt. I, p. 75.

FIGURE 3.

100	0	25	50	cwt. of carbonate of lime per acre.
50	100	0	25	
0	25	50	100	
25	50	100	0	

It will be noted that two treatments (0, 25) fall below the laboratory lime-requirement figure, while two (50, 100) are above. The following Table III gives the yields of various crops grown in the years succeeding 1928 :

TABLE III.

Dressing of carbonate of Lime.	1929 Barley.		1930 Sugar Beet.		1931 Sugar Beet.		1932 Barley.	
	Grain cwt. p.a.	Straw cwt. p.a.	Yield t.p.a.	Sugar %	Yield t.p.a.	Sugar %	Grain cwt. p.a.	Straw cwt. p.a.
0	9.26	9.54	4.05	16.69	0.61	16.35	2.01	0.75
25	15.07	13.58	9.09	17.07	4.62	16.78	14.79	15.04
50	16.06	14.12	10.25	17.14	5.24	17.03	23.03	19.69
100	17.11	16.40	10.09	17.19	5.70	17.41	24.25	21.09

Scrutiny of the yield figures shows, in every year, a large increase in crop as a result of liming. The big increase occurs on the plots receiving the 25-cwt. dressing. On the plots receiving higher dressings, although there are numerical increases in weight the differences are not statistically significant (except in 1929, when the straw yield on the more heavily limed plots was outstanding).

Examination of the percentage sugar of the beet crop in the year 1931 shows significant differences between the 0-50, 25-100 plots, a feature not apparent in the year 1930.

Although in 1931 the variation in weights between the three dressings 25, 50 and 100 showed no statistically significant differences yet the variation in growth between the plots could be seen with the eye. Still more apparent were the variations when viewed from the air. Fig. 4 shows a photograph taken from an altitude of about 2,000 feet.

The poor crop on the plot receiving 100 cwt. of lime on the bottom row was due to waterlogging.

Interpretation of Results. In addition to measurement of yields, changes in the constitution of the soil as a result of liming have been measured year by year (shown in Table I). From the very nature of the problem great soil variations are

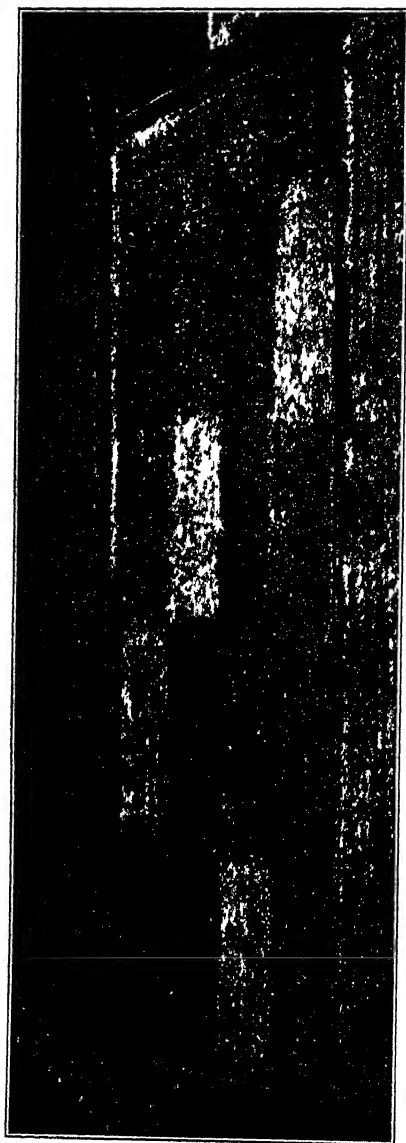


FIG. 4.—Liming Experiment—Sugar Beet, 1931.
Harper Adams College Farm.

likely and in point of fact do occur. Collaterally with these experiments soils from many beet fields, on which costs and accurate measurements were being made by the staff of the College Economics Department, were examined. On these some of the highest yields, in fact quite as high as on those where the soil was neutral, were obtained at a pH figure of 5.6.

The response of a growing crop to soil reaction suggests that the four following conditions may be true :

1. There is a critical pH point below which the toxic effect of excessive acidity causes crop failure ; thus for barley in the West Midlands it would appear to be about pH 5.2 and for sugar beet 5.3. The latter figure is corroborated by the late G. Newlands for Scotland¹ and Dr. P. H. Gallager for Ireland.² From the agreement of these figures for the widely distributed areas in Great Britain and Ireland these critical data are possibly less dependent on climate than some writers suppose.
2. There exists a limited pH range over which progressive crop improvement can be expected, as a result of decreasing toxic effect of acidity. In crops such as sugar beet this range is probably short, pH 5.3 to 5.6, while in other crops it may be shorter or longer.
3. Above the limits of the range suggested in (2) crops will grow normally until the effect of alkalinity is felt. An optimum is suggested by some writers, but in all probability no such point, in actual practice, exists.
4. There is a higher pH limit beyond which the toxic effect of alkalinity causes a rapid diminution in crop growth. This is practically never felt in modern British farm practice, but was probably operative in bygone days when large doses of quicklime were fashionable.

Application of foregoing data to General Advisory Work.

The reader will no doubt have concluded that the major problem involving the application of lime to a soil is in connection with removal of excess acidity. It should not, however, be thought that this is the only reason for liming, since lime acts beneficially in very many other ways. Some reference to these will be made at a later stage in this article.

The method of attack on the problem of acid soils depends on the appreciation of the foregoing explanation of crop response to soil reaction. In the case of diagnosis of acidity as a factor inhibiting the growth of crops, the matter is fairly

¹ *Journal of Agr. Science*, XVIII, 704.

² *Journal of Dept. of Agriculture*, 28th yr., No. 1 (Irish Free State).

simple. It involves the sampling of affected and unaffected areas and making direct comparisons of pH values, etc. In forecasting whether a particular soil is sufficiently well supplied with lime to prevent failure of a future crop, recourse must be made to the examination of the pH values on an adequate number of samples, taken preferably with the aid of the field indicator.

Should the general pH level be found below the critical acidity figure for the particular crop to be grown (usually allowing a safety margin of 0.5) the amount of lime suggested by the Hutchinson and McLennan method is recommended.

During the winters of 1928, 1929 and 1930 some 150 samples were submitted to the writer by the local Sugar Beet Factory after previous field examination by the fieldmen.

In most cases the pH figure fell below 5.8 (a figure which allows a reasonable safety margin) and liming was recommended at the lime-requirement rate. In one instance only was any criticism raised by the farmer. In that case it was subsequently learned that the lime had been applied too late to save the crop. In very numerous instances of other crops and soils the writer has found this method to be satisfactory.

Methods and Time of Applying Lime.

Careful application in order to obtain even distribution and mixing with the soil will repay the farmer who will go to the trouble of carrying it out properly. Too frequently lime is spread on the surface of a stubble or clover ley and ploughed in. Possibly, in the old days, when frequent dressings were the rule, this did not matter so much, but nowadays when more economic and less frequent applications are given it should be spread on the furrow and well harrowed or cultivated into the soil. Acidity can only be removed quickly if the lime is intimately mixed with the soil. For small dressings up to 20 cwt. or so it is best applied through the drill in ground form. For larger dressings lump lime is more often used and distributed after slaking. Application should be given in autumn if possible, and in any case not later than February, in order to allow the lime sufficient time to do its work. In the case of a very acid soil in which deep rooting, sensitive crops are to be grown (e.g., sugar beet, mangolds) it may be advisable to apply half the lime after the first ploughing, working it well into the soil, and half following the second ploughing, again with thorough working. Applications of smaller amounts than the prescribed quantities have, in the writer's recollection, sometimes proved expensive. As an instance, on a very acid soil with a high humus content crop failure took place even after two applications of lime, the whole trouble being that an

insufficient quantity had been given. A subsequent adequate dressing put matters right.

One or two instances of apparently anomalous behaviour of soils are worthy of mention. Even in the presence of free lime (in the form of calcium carbonate) considerable acidity may sometimes exist. This condition arises when hard granules of limestone occur scattered through the soil. In the immediate neighbourhood of the granule the soil is slightly alkaline, but farther away from its influence acid conditions (even as low as pH 5) can occur. In a case of this kind laboratory examination of a sample, without sufficient knowledge of field conditions, may be misleading.

Another condition of which the practical man needs to be wary occurs in some soils overlying limestone. Leaching of the lime may have gone on to such a degree that the residual soil is acid. Soils of this character occur in several localities in this country and may include instances of the conditions mentioned in the previous paragraph.

OTHER BENEFICIAL EFFECTS OF LIMING.

Heavy soils are improved in texture by liming. The effect is probably not only one of aggregation (where the clay particles tend to group themselves), since the physical properties of soils with a high content of lime are not particularly different from those in which the hydrogen ions (acidity) have taken its place. More probably the easier working properties are developed as a result of more active fermentation of the organic matter, with a consequent puffing and lightening effect.

Organic matter decomposition and nitrate formation proceed more rapidly under well limed than under acid conditions. The phenomenon is associated with a more active bacterial flora. Further, fixation of atmospheric nitrogen by the free living organisms such as *Azotobacter* and *Clostridium* is more rapid.

In areas where grassland occurs on naturally acid rocks, such as the Millstone Grits and Trias Sandstone, a mat of undecomposed vegetable matter tends to accumulate on the surface. Correction of this condition is satisfactorily effected only by liming. In this connection it is interesting to note that an improvement in quality as well as in quantity is obtained in the grass. Experiments at Harper Adams College show that more lime is taken up by the grass and built up into organic calcium compounds.

The importance to stock of grass richer in lime is now realised although much more work is needed on this subject. The effect of liming poor grass in an experiment on the Bunter Sandstone

in Shropshire increased the calcium content of the herbage by 60.4 per cent. (expressed as CaO in the ash).

The relation of liming to plant diseases is rather complicated. In some instances it undoubtedly helps to check attack, while in others it has the reverse effect. Lime has long been known to mitigate attack by "Club Root" (finger and toe, anbury, etc.) on cruciferous plants. In fact in the minds of some agriculturists the appearance of finger and toe in a crop has been taken to indicate acidity, but the writer has tested this point and has found some of the worst attacks on neutral soils.

There is a good deal of evidence, however, to show that, should finger and toe exist, the application of considerable doses of lime is beneficial in mitigating the disease; in all probability, the effect of increasing the soil pH above 7.2 or so by liming exercises a beneficial effect.

At Craibstone, the experimental farm of the North of Scotland Agricultural College, experiments¹ show that, even under the adverse conditions of turnips being grown every year on the same land, dressings of lime increase the percentage of healthy plants. This improvement is most marked in the disease-resisting turnip, the "Bruce."

TABLE IV.

LIME TREATMENT AND CONTROL OF CLUB ROOT.
PERCENTAGE SOUND BULBS.

	1916-1920.		1921-25.		1926-30.	
	P.	Q.	P.	Q.	P.	Q.
Ground Lime . . .	59.4	76.1	26.3	28.1	26.0	24.1
Unlimed . . .	27.0	33.2	3.0	3.9	3.5	5.9
Carbonate of Lime . .	59.3	68.0	38.7	31.7	25.4	17.1

YIELD OF SOUND BULBS—tons per acre.

	P.	Q.	P.	Q.	P.	Q.
Ground Lime . . .	12.7	14.0	13.2	12.0	14.9	13.7
Unlimed . . .	9.8	10.5	8.3	7.4	11.5	9.4
Carbonate of Lime . .	15.3	13.7	12.8	12.1	14.8	13.7

(P and Q represent duplicate sets of plots.)

Recent work by the Advisory Mycologist at Harper Adams College² with finely divided slaked lime suggests that a useful degree of control of the disease can be obtained. This work is still in progress.

¹ Prof. J. Hendrick. *Transactions of the Highland and Agr. Society of Scotland*, 1932.

² Advisory Report No. 7, Harper Adams Agricultural College.

DISADVANTAGES OF LIMING.

At the outset it is as well to state that the disadvantages of liming are relatively insignificant compared with the benefits that accrue. Only in particular instances do they develop to the extent of being of real economic importance. The caustic effect of overliming is seldom seen nowadays. Economic conditions forbid the use of such large dressings as ten or more tons of quicklime per acre which in the old days undoubtedly rendered land temporarily infertile.

A condition in trees referred to as "Iron Chlorosis" sometimes occurs on the chalk formation. It is due to a depression of the solubility of the iron in the soil by the presence of much free lime. Another interesting effect following liming on some soils is seen in the disease "Grey Spot" of oats. At present this has only been reported from comparatively few areas in Britain, but it is of considerable economic significance elsewhere. Affected areas running into many thousands of acres have been reported in Australia. The condition is one in which greyish spotting and streaking of the leaves occurs and is attributable to the inability of the plant to obtain sufficient manganese from the soil. In a case investigated by the writer and the staff of the Warwickshire County Council the oat plants were attacked when the leaves were about 6 inches high. The development of the disease was so rapid that in a fortnight after its first appearance most of the leaves were affected. In a series of experimental plots applications of manganese sulphate at the rate of 60 lb. per acre applied with the seed substantially controlled the attack and the oats ripened normally. Basic slag (containing 3 per cent. manganese) also exerted a beneficial effect. The action of both slag and manganese sulphate was most marked when adequate manuring was given as well. A solution of manganese watered on at the time of appearance of the disease helped considerably, but was not nearly so effective as the solid applied at seeding time. The addition of various soluble salts of iron watered on in solution at the same time was ineffective. Analyses of samples of the green material cut in early July showed the manganese content of the ash in the untreated plots to be .0028 per cent., while in those from the best of the treated plots to be .0066 per cent. Although no ill-effects could be seen on sugar beet and barley planted alongside, nevertheless difficulties with the latter crop are well known in Australia. The trouble usually occurs on sandy soils with a high humus content.

Heavy liming is known to favour attack by some fungus diseases; thus, *Phoma* in sugar beet is associated with an alkaline condition of the soil. It is a matter of common knowledge in

potato growing areas that applications of lime to the soil tend to aggravate common scab.

VARIETIES OF LIME.

Carbonate of Lime.

Ground Limestone is derived from natural limestone rock. Its value depends on its purity and degree of fineness. The Carboniferous Limestone formation usually supplies the purest forms, i.e., up to 98 per cent. Limestone should be so ground that 60-70 per cent. passes the prescribed sieve. Colour of the ground material is no criterion of purity and price should depend on analysis.

Waste Carbonates of Lime usually come from manufacturing processes such as tanning, chemical works, sugar manufacture, etc. The content of carbonate is very variable and absence of substances deleterious to crops is essential. Analyses of various limes of this class made in the College laboratory vary from 40 per cent. to 95 per cent. carbonate of lime.

Chalk is a naturally occurring soft rock almost entirely composed of carbonate of lime. It is usually carted and spread direct on the land where it crumbles rapidly under the influence of frost, etc.

Calcium Oxide.

Quicklime, Lump Lime, etc., is obtained from the burning of limestone, where 1 ton of pure rock yields about 11 cwt. of quicklime. This should be purchased on the basis of its purity.

Ground Lime. This material is ground quicklime and has the advantage (as a result of its fine state of division) of being capable of passing through a drill. This allows of its very even distribution. It is particularly useful when small quantities are required. Colour is no criterion of quality.

Lime Screenings is refuse from the kiln after the best lump lime is removed. It consists of slaked and quicklime mixed with ashes, etc.

Slaked or Hydrated Lime is a finely divided lime resulting from the addition of water to quicklime. It can rarely be applied economically to agricultural soils. It is probably beneficial in controlling club root on account of its very fine state of division.

EVALUATION OF LIME.

Lime should be purchased on its content of calcium oxide. In the case of carbonate of lime, although no free calcium oxide is actually present, this can still be done by dividing the percent-

age carbonate of lime by 100 and multiplying by 56 when the equivalent in terms of quicklime is obtained (for all ordinary purposes division by two is sufficiently accurate). On the whole lump lime is usually the cheapest variety. Ground quicklime and ground limestone are somewhat expensive on account of the grinding process. No hard and fast rules can be laid down as to the best variety to purchase. Except where application is to be made to growing crops, when carbonate of lime is advisable, almost any form of lime can be used. Proximity to source, cost of carting and spreading, amount required, as well as the cost per unit of oxide must dictate the variety to be used. In some cases the objection of workmen to handling certain forms of lime is a deciding factor. The agriculturist is strongly advised to have samples of lime analysed before he undertakes extensive liming operations. Of the numerous samples submitted to the writer during the last ten years many have proved unsatisfactory and some almost worthless. One case in particular is worthy of mention. A sample of so-called ground lime, quoted at 30s. per ton, was found to contain no lime at all and to consist of Bauxite (aluminium oxide), a worthless material from the agricultural point of view.

LIMING AND SOIL DISTRIBUTION.

In those districts where soil surveys are being made it is possible to show with the aid of maps the areas occupied by soils having potential lime needs and also those where liming may seldom be necessary.

Fig. 5 is a soil survey map of an area in North Shropshire. A number of separate soil series are shown, but of these only a few may be regarded as being general. These few, however, are likely to be met with over very large parts of the Midlands—in Shropshire, Cheshire, Staffordshire, Nottinghamshire, Leicestershire, Warwickshire, Worcestershire—and elsewhere. The remainder are of more local significance and smaller in area.

The Newport Series. This is one of general distribution and considerable importance. It is developed on Glacial sands and gravels mostly derived from Bunter Sandstone material. Its clay and humus content are usually low and its natural lime supply is practically nil. It very easily becomes acid, but fortunately needs only light dressings of lime to correct the condition. In good farming practice it is best to give a small dressing of lime (10–15 cwt. of quicklime) every fourth year. Moreover it should receive adequate quantities of all manures regularly. It is always highly porous and exhibits most of the symptoms of excessive drainage, *i.e.*, liability to poverty, acidity and drought.

The Bridgnorth Series. This is developed as a sedentary

FROM O.S. SHROPSHIRE SHEET XXIX S.W.

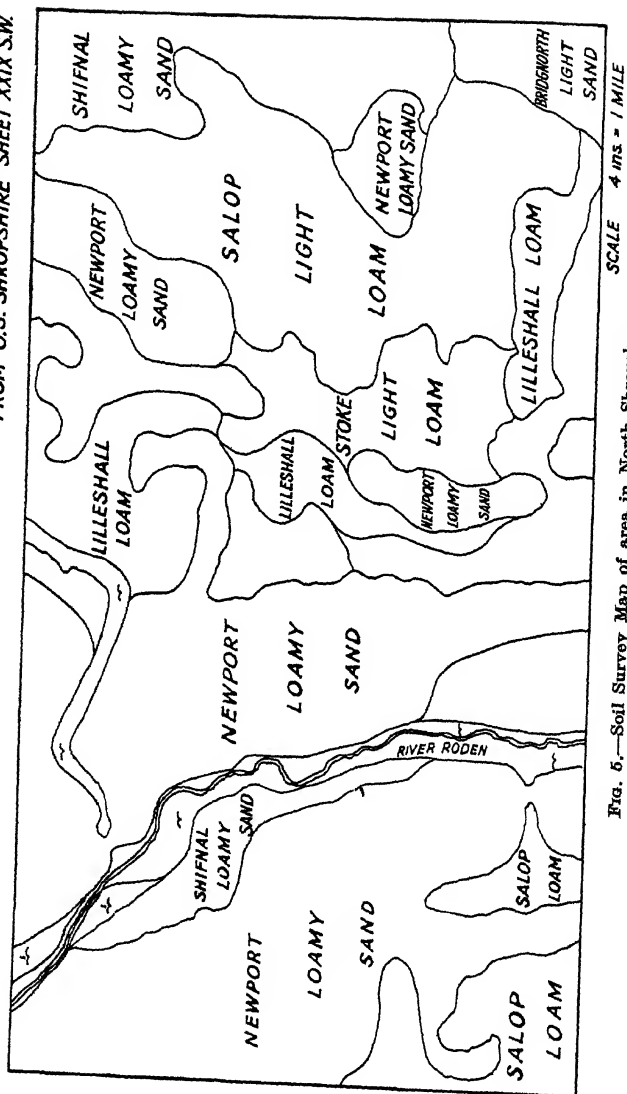


FIG. 5.—Soil Survey Map of area in North Shropshire.

soil on the Bunter Sandstone. In most respects it is very similar to the Newport Series but rather more compact and fertile. It is liable to become exceedingly acid, but small dressings will remedy matters. It is on this series that the liming experiment, referred to earlier in this paper, has been laid down.

The Salop Series. This is normally found on the heavier Trias boulder clays. The soil on the surface varies from a heavy to light loam, but the subsoil is invariably heavy with a clay content sometimes as high as 64 per cent. Since the material is derived largely from calcareous marls, acidity is usually absent. Drainage rather than liming is the major problem on these soils.

The Lilleshall and Shifnal Series. These rather important series are developed on the Upper Carboniferous Beds. Geologically these beds consist of alternations of sandy and marly phases and the particular soil series found depends on which of the two is dominant. The soils of the Shifnal series are often acid, but those of the Lilleshall series seldom so. The Shifnal series is rather outstanding in view of the fact that it is equally capable of supporting arable crops or pasture.

Detailed information of all the soils of an area, as is obtained in the survey, is already proving of considerable value in advisory work.

ADVICE ON MATTERS CONNECTED WITH LIMING.

The agriculturist is now able to obtain expert information on the condition of his land and crops and the need or otherwise for liming. In practice the question of liming cannot be treated without reference to the question of manuring, since each aspect is intimately associated with the other. From the point of view of liming the services of an adviser are usually required for one or other of the following reasons :—

1. To investigate partial or complete crop failure.
2. To examine the soil and predict the needs or otherwise for lime for particular crops.
3. To investigate herbage or soil conditions in connection with nutritional difficulties with farm stock.

Application to the Consulting Chemist of the Royal Agricultural Society, or to the Advisory Chemist at the Provincial Advisory Centre or to the County Agricultural Organiser will be sufficient to obtain the services of a person competent to deal with the subject.

W. MORLEY DAVIES,
Advisory Chemist.

Harper Adams Agricultural College,
Newport, Shropshire.

FORESTRY AND THE FARMER.

THE average agriculturist may regard the title of this paper with surprise, as combining together two rural industries which have existed in more or less watertight compartments from time immemorial, and he may well enquire as to the suggested connection between the two.

Before the war forestry, or sylviculture as it is more correctly called, was a matter entirely confined to the estate and the farmer was not, as a rule, apart from occasional grievances connected with game, interested in woodland. Not only did he take no interest in forestry, but there have been times when he was distinctly opposed to it. Arthur Young, for example, says: "The more wood there is in the Kingdom the fewer people must necessarily be fed on the product of our own soil." This seems hardly true. There are areas on many farms that the plough or spade cannot touch, and that are, therefore, useless for tillage. It is with these that this paper proposes to deal—the waste places of the farm. The character of these "waste places" will vary according to the size of the holding. For example, land which on a large farm might be considered useless from an agricultural point of view might still be considered as worth working on a small one, so that strictly speaking the definition of waste land will depend on the circumstances, the situation and the owner.

Owing to the great break-up of estates in the early post-war period, times are greatly changed; there are now many hundreds of farmers who find themselves owners not only of agricultural land but also of wind-breaks, small plantations, banks and marshy places which bring in little or no income. These are often regarded rather as a liability than as an asset. It is suggested that "forestry" or the growing of trees may be of some use in such cases.

Before going further it is necessary to consider the arguments for and against the presence of woodland or trees on farm lands. There are several arguments against farm woodlands. Perhaps the two that are oftenest advanced are that shade interferes with the growth of cereal and other field crops, and that woods encourage weeds. The first is doubtless true to some extent and is possibly very real where fields have round them tall trees which cast a very long shadow; but such very tall trees are, in any case, out of place on a farm, tall timber not being a thing that the average farm needs to produce. Weed seeds, it is true, may be carried to a field from adjoining plantations, but if a tree crop, especially a coniferous one, is properly looked after, there will be no weeds worth mentioning under its shade; in any case

if existing plantations are neglected, or if felled strips are not replanted, there will always be far more weeds than if the land were properly dealt with. If land is lying derelict the weeds upon it will have to be cut and the fewer there are the less the labour utilised for this purpose. Moreover farm weeds are, as a rule, light-loving plants which do not flourish to any extent under shade.

It has been stated that the presence of trees near pasture encourages flies, with a consequent increase in such diseases as mastitis, but so far this cannot be considered as proven. As regards warble flies the shade of trees is definitely beneficial, as these flies avoid cool places and prefer the open fields and muggy, warm conditions. Blow-flies among sheep are known to be especially prevalent where park grazing is practised, but in such cases the areas are definitely enclosed and comparatively airless. The average farm will never be so heavily wooded as to set up such conditions and so this argument against trees on farms does not appear to carry very great weight. It is quite possible to plant shelter belts and plantations in such a way that protection is assured without interference with the broad sweep of air which is so essential to the well-being of most farm stock.

It is also alleged that roots of trees stretch out into fields and choke drains. The roots of very large trees may indeed do so, but except in isolated cases very large trees should not be grown. This trouble, as a rule, is due to hedgerow trees rather than to those in plantations, and on arable ground the frequent cultivation will deal with the roots. There is certainly truth in the statement that drains get choked, especially near field boundaries, but this is no more than an occasional trouble. Again it has been stated as an objection that plantations involve more fencing. As regards fencing against stock, derelict woodland requires fences just as much as actual wood, and plantations themselves will eventually supply their own fencing material. Upkeep of plantations need not necessarily be expensive. The tendency among foresters to-day is to eliminate all but the most necessary weeding and cleaning; young trees are very cheap, and the farm labourer trained to the spade and bill-hook does not need much teaching to be able to plant trees or cut over coppice wood properly. The advantages of conserving or improving the farm woodland are shown in an increased and regular supply of wood. Material is available for hurdles or for use as foundations for stacks (a practice objected to by some on account of its harbouring vermin but still very popular); for thatch and rick pegs, bars for heavy gates and general repair; for firewood and for the multitudinous timber requirements of a farm, which otherwise involve direct outlay. Where pasture is sheltered from cutting winds a comparatively early "bite" can

be anticipated, at any rate on a section of the field. Woodland is invaluable as shelter for stock, especially on uplands and exposed downs, and the careful placing of shelter-belts of reasonable width is equivalent to improving the climate of the farm. In winter, especially in case of snowstorm, its value to the shepherd is incalculable. Cattle, too, are enabled to graze satisfactorily much further into the winter and with hay will frequently do better than they will in yards.

In this connection the opinion of Sir E. J. Russell will be of interest. Writing on "The Reclamation of Waste Lands" in the Journal of this Society in 1921 and dealing with moorland and downs under 1,000 feet elevation, he says: "Steep valleys are suitable for woods and a desolate appearance can be changed by a generous introduction of trees into the landscape. Woodland belts can make arable cultivation and sheltered grazing possible."

SPECIES TO PLANT.

The correct choice of species is a most important point because mistakes take a long time to rectify. It is quite impossible to give definite recommendations for particular cases unless all the circumstances are known. Aspect, soil, rainfall, degree of shelter and height above sea level are among the factors affecting tree growth. The following notes must therefore be taken only as a rough guide to the cultivation of those species which are worth growing from an economic point of view, bearing in mind that planting is done chiefly with a view to the utilisation of the produce on the holding—as firewood, fencing, gates and the like.

The most important tree is *larch*, which grows quickly and can be utilised for fencing at from 15 years upwards. There are two varieties, European and Japanese, the latter growing rather faster when young and being less liable to disease. Larch prefers an open, well-drained soil and as a rule will grow well where bracken flourishes. It prefers a north aspect and does not like strong winds. Japanese larch likes a moister soil, will grow on clays, and resists frost better. Larch mixes well with Spanish chestnut and also with beech.

Scots pine is cheap to plant and easy to grow; it is especially suited to sandy soils. It will in fact succeed on most soils, but should not be planted on heavy clays. It is very resistant to frost and can therefore be planted in grassy places where other trees would be killed out. When young it makes quite an excellent screen, but after about 25 years its value as a wind-break diminishes. The timber, when used for fencing, should always be creosoted.

On chalk soils *Corsican pine* grows very rapidly but it prefers dryish gravels. It is a very difficult tree to transplant and numerous replacements are often required. It should be put in as small plants in April.

Austrian pine is a rough tree with thick foliage. It is especially suitable for wind-breaks or shelter, especially on chalk downs.

Common spruce is useful on heavy clays and peaty soils. When planted close it will produce timber fit for fence rails and for inside farm carpentry. It does not seem to be so useful as *Sitka spruce*, which grows more rapidly on the same soils, but is, however, very liable to frost damage during its early stages. Once this danger is passed the tree may put on three or four feet of growth annually.

Douglas fir will grow on larch soils but will not succeed if lime is present in the soil. It produces big poles, which are almost as durable as larch, very quickly. It dislikes wind, as when young the trees have a poor hold on the ground and are easily blown out.

Amongst the hardwood trees *Ash* is perhaps the most useful. It grows quickly and can be used or sold at practically any age, two-year coppice shoots, for example, being made into walking sticks. Preferring a moist soil with some lime content, it does well in ravines and on moist slopes near streams. It requires shelter from frost and is best grown in company with beech, larch or Spanish chestnut. As a rule ash should be felled at not more than 60 years old and on clayey soils much earlier; if allowed to stand too long the interior becomes "blackhearted." It is a first-class tree for coppice, the poles not only being useful in many ways on the farm but being easy to sell for handles. Self-sown trees are common in damp woods and these should always be encouraged by letting in light from above.

Spanish chestnut prefers deep warm sandy loams, but will grow good poles on clay soils. It does not like chalk. The timber makes excellent "post and rail," is almost as durable as oak and is produced much more quickly. A good coppice tree.

Except in isolated cases *beech* and *oak* are not recommended. The former makes an excellent "nurse" for other trees (its leaf fall especially being valuable) and for that reason some beech should always be added to larch and ash crops. As a pure crop it is difficult to raise successfully and the timber is of little use on the farm. There is also little inducement to plant oak, because chestnut—a faster-growing tree—can be used on moist soils for the same purposes. Moreover, the successful raising of oak is a slow and highly-skilled operation.

In wet places *poplar* can be planted, preferably the black or grey variety. It grows very quickly, often reaching a height of

50 feet in ten years. It requires plenty of space, at least 20 feet each way, and will not stand exposure to strong wind. In such places the stem gradually assumes a curved shape and is then almost worthless. Poles, when creosoted, have quite a considerable life. The timber has no market value until a large size is reached, which in favourable places takes forty years or so. It is an extremely cheap tree to establish.

Finally, those who have the interests of their descendants at heart and have a deep, light loam available, are recommended to plant *Walnut*. No tree is in greater demand or in shorter supply.

As a guide to those who wish to plant on high land, it should be stated that as a general rule good timber will not be produced above the 1,000 foot contour. Shelter from higher land to windward will, however, often assist growth to a considerable degree and good shelter belts can be raised even up to 1,400 feet provided the soil is suitable. A rough guide to soil qualities may be obtained from the ground vegetation. *Sphagnum* and cotton grasses indicate very poor soil practically unplantable. Heather and the inferior pasture grasses indicate land worth planting for shelter. Bracken land will grow trees, its quality varying according to luxuriance of growth. At lower elevations wild garlic indicates soil eminently suited for ash.

PLANTING AND AFTER-CARE.

Forest trees are generally planted out in the woods from a nursery in which they have already been transplanted once or more in order to obtain bushy roots. There are many commercial nurseries specialising in these trees, and to-day prices are lower than they have been for many years. Trees are generally planted out at four years of age, having stood preferably two years as seedlings and two years as transplants. In some cases, however, trees which have stood only one year as transplants are better, larch being a notable example. This species often makes considerable growth in the fourth year, producing a sappy shoot which does not take kindly to moving. As a general rule the smaller the tree the better; the small tree transplants more easily than the big one and soon catches it up. A small, sturdy tree with plenty of fibrous roots is the ideal to aim at. Lanky trees are often weak, their height being due to excessive crowding in the nursery.

Excellent pine, larch and spruce can be obtained to-day for well under 40s. per 1,000. Hardwoods, such as beech, ash and chestnut generally cost about 45s. per 1,000. Hence when one takes into consideration the comparatively small areas on the farm that are to be stocked, the cost of plants is not high. A thousand plants is more than sufficient to stock half an acre.

The greatest enemies of trees are rabbits. If these exist in any numbers the idea of forestry must be given up, or else the area must be fenced in, which considerably increases the expense. Rabbit fencing need not be elaborate. It may consist of 5-inch posts split into two and driven at 12-foot intervals, having stout posts at 50-yards intervals and at corners. Barbed wire is used for the top, the netting being hung to the barbs. The specification for netting should be 42-inch width, $1\frac{1}{2}$ -inch mesh and No. 18 gauge. The bottom 6 inches is turned outwards, laid flat on the ground and anchored by sods at 1-yard intervals. If posts are available on the farm the cost of the complete fence is about 8*d.* per yard. Hares must also be taken into consideration as they are fond of the tops of young hardwoods, especially ash, nipping these off and so ruining the tree.

When stocking new plantations the distance between trees is important, as the greater the distance the lower the cost. Some species, such as pine and oak, must be planted closer than others, such as larch. The former have persistent side branches which do not fall off easily unless the plantation is dense. The chief aim, however, is to get the ground completely shaded by the crop as soon as possible; hence small trees must be planted closer than big ones, and planting on bad soils must be closer than on good. Costs, however, mount up rapidly with closer planting. If it costs £5 to plant an acre of trees at 5-foot intervals, it will cost £10 to plant the same area at intervals of 3 feet 6 inches. At 6-foot intervals the cost will be £3 12*s.* 6*d.* The number of trees per acre would be 1,750, 3,620 and 1,210 respectively. If any planting distance is halved the expense is increased four-fold. Generally speaking the accepted distances in ordinary soils and situations are as follows:—

Larch, Sitka Spruce, Ash, Douglas Fir and	
Chestnut	5 to 6 feet apart
Pines, Oak, Beech	4 to $4\frac{1}{2}$ feet apart

METHOD OF PLANTING.

There are several methods of planting. Where only small areas are being dealt with, however, that known as pit planting is by far the safest and best. The method explains itself, but care is necessary to see that the tree is not planted too deep, that its roots are well spread out, and above all, that it is trodden in *hard*. On steep slopes the earth should be cut away on the upper side and the lower side banked up so that the tree is upright. In wet places where spruce is being planted, it often pays to cut out a thick square of turf, turn it upside down, and plant on the top. Quite small plants can be used in

such cases and if a little basic slag is added at the time of planting this is all to the good. If a grass field is to be planted difficulty may be expected in getting the trees started. The turf appears to hold up supplies of both food and water, while frost damage is often great. If it is possible to plough up the turf matters will be much easier, especially if some sort of crop is taken before planting the trees. Arable land is frequently found to have below the surface a hard layer formed by the repeated action of the plough blade, and this will hold up water and prevent the tree roots penetrating downwards. The only remedy appears to be a deep ploughing or fairly deep spade holes for the trees, whichever is the less expensive.

After-care is important, especially where weeds grow strongly. These, if neglected, may smother the young plant. Far less cleaning is necessary than is generally imagined, and with coniferous trees all that is necessary is to keep the leading shoot clear. Bracken may be a nuisance, as apart from anything else a heavy snowfall may crush it down on top of the young tree; it must therefore be cut or switched twice in the year.

During the first two or three years any dead trees should, of course, be replaced, but, as the block grows and the branches begin to cover the area, replacement becomes unnecessary and, in fact, practically impossible.

THINNING.

When a plantation has got into the pole stage it will be necessary to start removing superfluous stems in order to give the best trees enough room to develop. Left to themselves the trees would fight it out, but the crop would suffer in the process, coming finally to consist of a few big trees and a great number of overgrown, lanky and weak specimens. In order to prevent this trees are taken out every few years, starting when the trees are about 20 feet high with diseased, dead and dying poles. When trees are planted wide apart this first thinning will be later, and with very close planting it may be earlier. Further cuttings will be necessary at intervals of five to seven years until the wood is about fifty years of age.

With conifers the crown of live branches should always form one-third of the stem. If it is less the trees are probably too close. It is theoretically quite incorrect to attempt to carry out thinning operations on the basis of a given number of stems to the acre at a given age, because the correct number is bound to vary according to the quality of the land. Nevertheless, it is a distinct help from a practical point of view to know the number of trees standing on a good class plot at a certain age, provided this be taken only as a very rough guide :—

Quality: Average—i.e., not absolutely first-class.		
Species.	Age.	Stems per acre.
Scots Pine	25	1,350
" "	50	480
Larch	25	850
"	50	310
Spruce	25	1,450
"	50	325
Chestnut	25	900
"	50	180
Ash	25	700
"	50	160

COPPICE.

In the Southern and Midland districts a good deal of the woodland that has passed with farms will be coppice. Owing to the decline of rural industries much of this is in a dilapidated condition, but there is no reason why, with a little care and attention, it should not be turned into an asset of value to the holding. Coppice on a big commercial scale is to-day a non-economic proposition, but comparatively small areas can be made to supply many farm requirements once obtainable from the estate woods but now often purchased. Hedgestakes, pea sticks, bean rods, material for thatching, fencing poles and posts, firewood, wattles for hurdles, material for cleft gates and heavy gates are a few examples. Any surplus over the needs of the farm may usually be disposed of locally.

Coppice grows better in full light than under shade. Hence where improvements are intended it is well to remove any straggling and unthrifty standards (generally oak) and utilise these as best one can, *e.g.*, for posts or firewood. The stools or stumps from which the shoots spring will next need inspection. Any very old or rotten ones should be destroyed, since growth from these is slow and the lower part of the shoot is of poor quality. The most valuable stools are ash, sweet chestnut, oak and, where wattle is required, hazel. Beech is of little use except for firewood. In the normal way these stools should stand about 9 feet apart, or between 500 and 600 per acre. Gaps may be made up by planting young trees. These ought to be about 4 feet high and are quite inexpensive, costing about a penny each. They must be watched, and shoots from adjoining stools that threaten to suppress them must be cut away. If rabbits are numerous a ring of wire netting round each young tree is a necessity, raising the total cost per tree to something under 4d. Pieces of tarred felt tied loosely round the stem are much less costly, but these require more attention than netting. The wire netting ring should be left loose, being simply anchored in one place. A rabbit touching a loose ring usually suspects a trap and leaves it, which is not necessarily the case when the ring is

firmly fastened down. Provided the total area is large enough arrangements should be made to cut one section each year. For example, if the poles can be cut at fourteen years old, one-fourteenth of the area should be taken each year. Unless the group is a large one young trees should be planted only on newly-cut areas, because they require as much side light as possible. It must also be remembered that mixed coppice should be avoided as far as possible because the lives of the different species as "stools" will vary. Hazel, particularly, should not be mixed with other species; on the other hand ash and chestnut poles grow well together. It is a mistake to aim at a large number of poles from each stool; the outside ones will be curved and the inner ones suppressed and what is gained in number will be more than lost in inferior quality and size.

Bad cutting of coppice shortens the life of the stools, which soon rot away. Especially is this true when cutting is done by means of alternate left and right strokes that leave a V-shaped gap for water to collect in. Well-cut coppice is the exception rather than the rule, yet it is no more expensive to cut with a smooth sloping surface than in any other way. If trees or poles that shoot from the stool are being felled they should be cut very low down, high stools soon rotting and producing lower shoots that are always curved. Where the ground is wet and liable to flood, however, high stools, especially of alder, are permissible.

So much coppice has recently been allowed to deteriorate or has been turned into high forest that it seems not unreasonable to anticipate a better demand in the future for well-turned-out stuff. One thing is certain, that sales of coppice wood depend entirely on the energy and business aptitude of the vendor, who will usually find that many small sales pay better than a few big ones. It is usually very unsatisfactory to sell standing and allow the purchaser to cut.

Should the owner be anxious to get taller timber than he can expect from coppice, with a view either to shelter or to saw timber, the coppice ground can be stocked by cutting away from each stool all but the finest pole, which is left to grow into a tree. The trees so produced will never be very large, but the method is a very cheap one of producing timber. To improve the return ordinary forest transplants can be planted over the coppice ground in groups of a dozen up to 250. They must be planted in groups so as not to affect younger plantings. This method has advantages. At each cutting of coppice the best trees in the groups can be marked and left, the worst being taken out; failures here and there do not matter and the expenditure is not great, provided always that rabbits are kept down. The stumps of defective hardwood trees will shoot and improve the

coppice stock, and if the trees that are allowed to grow up are of a light foliated type they will not interfere with the coppice crop, and having been grown in groups will make better class butts than if they had been planted singly amongst the coppice stools.

SHELTER BELTS.

Shelter belts are generally planted on exposed ground in the form of long strips, but small irregular spaces may also be utilised by planting them with trees to form clumps. Belts need fencing, this being of course an objection to their establishment, but the cost can sometimes be minimised by using existing fences or hedges. Their value as shelter for stock depends on

- (a) their position ;
- (b) their width ;
- (c) the constituent trees and the method of planting.

Position will vary according to circumstances, but as a rule it should be broadside on to the prevailing wind. In wide valleys (which often act as funnels for the wind) planting across the valley may prove more effective than planting against the ordinary direction of the prevailing wind.

As a rule a width of 45 to 60 feet is a minimum, as in narrower belts the trees do not grow so well. Straight-edged strips should be avoided if possible, the inner face being given an undulating shape with bays as deep as possible without interfering with the minimum width of the belt.

The trees on the windward side should be hardy types that will stand up against wind and that will remain branched well down to the ground. This is an important point to remember when selecting species because the tendency is for most trees to lose their lower branches as they grow—Scots pine being perhaps the best example. There are many plantings in which this fact has been overlooked, with the result that by middle life they have become open at the bottom and have thus lost much of their value as wind- or snow-breaks. Trees must be planted wide on the outer edge, at any rate for the first two or three rows, in order that they may keep well branched and get a good root-hold ; 8 or 9 feet apart will not be too great an interval. For the inside the interval may be reduced to 6 feet. Planting should be done in “ quincunx ” or triangle fashion, the trees in one line being opposite the gaps in the next in order to give more resistance to the wind than would be obtained by planting in “ squares.”

The species chosen will vary according to soil, but sycamore, white poplar, beech and Austrian pine are all excellent wind resisters. Further inside the belt Scots pine may be used on light

soil, and spruce (especially white spruce) where the soil is heavy. Larch may also be included with the idea of cutting it out as poles later on. It will probably prove most satisfactory to plant the main species in definite lines instead of mixing indiscriminately. On wet soils alder is useful and the white variety (which incidentally will grow on dry soils as well as wet) throws up suckers freely and so gives additional protection low down where it is wanted. If the pines are found to grow too fast, and if timber is not required, the leading shoots can be cut away when the required height is reached, this keeping the trees thick and bushy.

When existing belts are to be felled or repaired, spruce, beech, yew, *Thuja*, Lawson's and *Macrocarpa* cypresses can be put in, as all these will bear some shade from the older trees. If the existing trees are well up, it will probably be better to make a new planting, preferably on the leeward side. Three or four rows of trees should be quite enough. The plants used should be small, with bushy roots, and should be frequently inspected and trodden in when necessary.

As regards certain of the trees mentioned above, Lawson's Cypress is a hardy quick-growing evergreen screen tree with a tendency to bushy growth. It will do on most soils but should not be planted in very exposed places, unless protected by several rows of another species. *Thuja plicata* is a frost-hardy tree that will grow successfully in wind-swept places. It likes a moist soil. *Cupressus macrocarpa* is hardy and windfirm. It is a very fast grower and branches well down to the ground. The Mountain Pine (*P. montana*) is a small bushy pine which will grow anywhere and on any soil, including peat. It is an excellent tree for the windward side of a plantation of Scots pine as, growing more slowly, it helps to hold the screen as the lower branches of the Scots pine die off. Sitka spruce is also worth trying on peaty soils.

Pinus insignis and *Pinus pinaster* are excellent screen trees for planting near the coast as they stand spray- and salt-laden winds extremely well.

HEDGEROW TIMBER.

There is a considerable amount of disagreement on the question whether hedgerow timber is a liability or an asset to farmland. Upon the whole—in the absence of adjoining plantations or where shelter is not supplied by the configuration of the ground—the presence of trees around grass fields is beneficial, provided that they are of a type that grows straight, with not too large or dense a crown.

On fertile soils elm has been the chief hedgerow tree and it has certain advantages. It grows fast, is tall with a compara-

tively narrow crown and gives plenty of shelter without too much shade. It has, of course, a reputation for suddenly dropping branches, but one seldom sees or hears of damage to stock from this cause. One hears much of the liability to "windblow" but this occurs most frequently on the sides of very deep ditches or along roads which are below the level of the adjoining fields. Such a situation results in an unbalanced root system and a weakened resistance to wind. Hedges where elms have stood are generally full of elm suckers, the most suitable of which can easily be trained up into trees. Oak, preferably the sessile variety, is a good tree to grow; so also is sycamore, wherever there is a dead fence rather than a hedge below, as it has a poisonous "drip." The lime is a useful quick grower and ash may also be planted, although its timber will never be very good.

Large plants should be used, from 6 to 8 feet in height, costing about 1s. 6d. apiece. They must be protected from damage by horses.

Conifers are of no use as hedgerow trees; the only possible one is larch, but even this, if exposed, becomes curved and ugly. Poplars, especially black poplar, also become curved. The grey variety is perhaps the best. Where there are no hedges white-thorn as a tree is useful as it takes up little space and with its twisted twigs gives more shelter in winter than larger trees.

It is better to plant or preserve hedgerow timber in comparatively closely-spaced sections of a few trees rather than to have the same number evenly spaced. The trees grow better in groups and give more shelter.

Hedgerow trees around arable land are not at all desirable. The worst are ash and poplar, both being greedy and wide-rooting types which do the land no good.

When trees have a possible commercial value, nails or hooks should never be driven into the trunks. These quickly become hidden and their presence has ruined many good saws. No timber merchant will buy, except at a rubbish price, timber that he suspects of containing "iron."

THE CRICKET BAT WILLOW.

The possibility of successfully cultivating willows for cricket bat manufacture is one that should not be overlooked, at any rate by those living in the Midlands and Southern half of the country. General opinion holds indeed that bat willow cannot be successfully grown outside East Anglia, but general opinion is not correct. It is quite possible to find excellent timber that has been grown in Middlesex and Berkshire, Surrey, Sussex and Gloucestershire, and this is not a complete list.

Bat willow growing may be made a useful sideline to the farmer. It must indeed be described as a gamble, but it is a good one. If it is successful the profits are high, and if it fails the loss (provided that the whole matter has been approached in a common-sense way and purely as a sideline) is very small.

The success of bat willow cultivation depends very largely on the soil, for on the soil depends entirely the rate at which good trees can be produced. Quite often, however, land that seems perfectly suitable as regards texture, quality and moisture, will yield timber of poor quality which realises practically nothing.

Provided that a few elementary rules are borne in mind, the planting and after-care of bat willow presents no difficulties. The two most important points are, firstly, the purchase of the correct species or variety, and secondly, the choice of the site.

If bat willow were a distinct species with characteristics such as distinguish beech from oak or even beech from hornbeam, one of the chief obstacles to its production would disappear. Unfortunately the tree is a member of the willow genus which exists in greater numbers of types, varieties and hybrids than any other grown in this country. Thus while there is only one willow suited for high-class bat-making, there are several that resemble it to a certain extent. The result is that there are thousands of trees, considered by their owners to be bat willows, which will never find a market as such. It may be added that true bat willow, as far as we can judge, is a "strain" which needs to be captured and held in the same way as an egg-laying strain of fowls or a good cropping strain of potatoes. It is only recently that serious scientific research has been devoted to this subject and there are as yet no definite results to be reported. The chief object is the actual pinning down of the variety or hybrid known as *Salix caerulea*, the Blue or Bat Willow. Another point is timber colour. First-class bat willow to-day must be white; coloured willow (reddish timber) is regarded as inferior. This coloured timber may constitute as much as 75 per cent. of the tree and the buyer who meets this trouble becomes shy of buying other trees from the same area.

The above remarks have nothing to do with actual practice, but have been made in order to emphasise the difficulty of finding the right type of tree to plant. Generally speaking the true bat willow, as a growing tree, can be definitely identified, but this does not hold true of the "set" or "cutting" by means of which it is propagated. The first question then which the practical man will ask, is how he can ensure against planting the wrong kind of tree. The answer is that cuttings should be bought only from a grower who is known to possess the right stock and who will guarantee it.

Cultivation.—When preparing to plant bat willow choice of soil is all important. In the first place it must be of open texture and well drained. Loam over clay is suitable provided that the clay is at least three feet below the surface. Alluvium is excellent, but peaty soil is not. Satisfactory results have been obtained on chalk marl, and ordinary clays, if well drained and not too heavy, will grow good timber. Areas containing stagnant water are, useless; the trees will live, but that is all that can be said. The ideal situation appears to be some feet away from a running stream, but perfectly good trees can be grown in hedgerows and alongside big open field ditches.

Planting distance is most important. Bat willow must have plenty of light on its lower branches as well as on the upper part of the crown, and much side light is necessary. The best method is probably to plant in a single line around the edges of permanent grass fields, the trees being at least 30 feet apart. If planting is done in blocks (and it is not recommended) each tree should be at least 30 feet from its neighbours. The reasons against planting around arable fields are so obvious that it is unnecessary to mention them.

An important point that must not be overlooked is protection from stock, especially horses. Two stakes with barbed wire coiled round them will generally prove sufficient, but better still is a line or two of wire as a fence. When the trees are well rooted and steady, wire netting may be put round the trunks, but it must not be nailed or attached to the bark in any way. Rabbits can do much damage but can be dealt with by means of a loose ring of netting around the base of the tree. This can be removed when the bark becomes thick, a few years after planting out.

The actual method of propagation is by means of big cuttings technically known as "sets"; these are generally 12 to 14 feet in length, about 2 inches in diameter at the butt end, and three years old. They must be as straight as possible. At present good ordinary sets can be purchased for about 2s. or 3s. each, but where only a few are being planted it is worth while to pay a little more for absolutely straight cuttings. Curved sets mean curved trees or at the best a proportion of distorted timber in the tree, and this will interfere with cleaving when the tree comes to be felled. Any pruning wounds on the cuttings must be small (preferably under $\frac{1}{2}$ inch in diameter) and at least 10 feet of the set must be clear of branches, so that after planting there may be 8 feet of clean stem.

The method of planting is simple. A hole 2 feet deep may be made with a bar and into this the butt end is thrust. This requires some care, because if the soil be close textured or the hole too small, bark may be badly damaged and rooting

power destroyed. A better way is to dig a hole a foot deep and then to make a bar hole in the bottom. In this way steadiness is ensured while the comparatively loose top spit favours root production. After-care consists, in the main, of rubbing off as soon as they appear all buds on the clear section and in keeping the top soil firm around the stem so as to prevent rocking. Nowadays merchants prefer a short butt of some 7 feet 6 inches in length. There is, therefore, little to be gained by allowing the butt to run up to a considerable height, as has been the usual practice in the past.

What is required is speed in growth to attain a diameter of 16 inches, at a height of 5 feet, in as short a time as possible. If this should take much over twenty years the result cannot be described as good. The best trees are felled about ten to fifteen years from planting, and occasionally at eight years; this has been done in the West of England as well as in East Anglia.

Little is known about the use of manure for forcing growth, but practical experiments indicate that the judicious application of farmyard manure is of distinct value. The writer has recently seen a tree, planted three years ago, grown in ideal circumstances by the edge of a small stream and treated with farmyard manure—the top 12 inches of soil having had a 50 per cent. admixture. This tree is already over 7 inches in diameter. It is increasing at a rate of well over 2 inches diameter per annum, and if it continues at the present rate will probably be ready to fell in less than nine years.

The uncertainty of success must be emphasised once more; if success could be assured the present high prices would not prevail. But on any soil that appears suitable bat willow is well worth trying. The trees, being far apart, seem to do no harm to the grass below, and the time between planting and felling is very short indeed compared to that of other trees. Where the experiment is successful the returns should be satisfactory, for prices seem likely to remain high for a good many years to come. Statements of value are apt to be misleading, but to-day about 15s. per cubic foot, or £6 to £7 each, is quite an ordinary price for good trees. It is possible that increased planting may lead to lower prices, but even a 50 per cent. drop would still leave a satisfactory return on the investment. Quite recently a farmer who had planted a thousand “willows” around his grass fields for shelter sold them about fifteen years after planting for over £1,000. Last year also the writer was shown, in Middlesex, many trees, twelve years planted, which had been sold at £12 apiece. Returns like these cannot be expected as the rule, but there is no reason why they should not occur again.

The fact that land is outside East Anglia should not deter experiment. Apart from the fact that excellent willow has been

grown in many places outside this district, it is probable that the spread of "water mark" disease will in the future definitely lessen production in the old bat areas of Essex and Suffolk. The demand for high-class willow still exceeds the supply.

In the absence of previous experience, planting should be done only upon an experimental scale. In a very few years the probability of success may be gauged fairly accurately, and at the worst total failure will not involve heavy loss. There is no reason why, if small plots of suitable land are available, the growing of sets for sale should not be tried. Cuttings from the tops of pollarded trees are still utilised, but the general method nowadays is to raise sets from pieces of willow, about 3 inches thick and 3 feet long, planted about 5 feet apart in blocks. The ground must be kept clean and only two or not more than three shoots per stock allowed to grow. Once these stocks are established several crops can be taken from them. It may be taken as a gauge of success that first-year shoots should average at least 6 feet.

TIMBER PRESERVATION AND CONVERSION.

The artificial preservation of fencing and gates is a matter that deserves more consideration than it has had in the past. Although the initial cost is increased, it is well known that the life of many timbers, especially those planted in the ground, is increased to an extent that more than compensates for the expense incurred in preservation. Scots pine, when treated with creosote, has a life of up to twenty-five years, against some five years for untreated posts. Many other species that rot quickly (such as beech) can, after treatment, provide fencing that will last for twenty years, which is five or six times their life in the untreated condition.

The usual method of preservation is that of "brushing on," but since timber standing outside frequently splits or is damaged this treatment is often ineffective. The most satisfactory way to treat timber is by the "pressure" system, in which case the creosote is injected into the wood after the air has been drawn from it by means of an air pump. This is, however, for practical purposes, unnecessarily thorough and too expensive. Not only is too much creosote used, but the smallest available plant, which takes only some 60 cubic feet of timber at a charge, costs over £200. Creosote to-day costs about 6d. per gallon.

There is, however, another process, known as the "Hot steeping process," which is far less expensive to operate and which may be carried out quite efficiently by means of an old boiler with a rough flue and chimney. The boiler or tank need

not be thicker than $\frac{1}{2}$ inch. A tank should, however, either be reinforced with angle irons or should be sufficiently stout to resist the action of high temperatures. It will probably be found more convenient in use when partially let into the ground. If wood is to be used as heating material fire risk must not be lost sight of and it is, therefore, as well to fix the apparatus well away from sheds or stackyards.

The *modus operandi* is simple. The timber is immersed in the creosote and is kept under by rough, heavy baulks. The tank is gradually heated to about 200° F., and is kept at this temperature for about an hour. It is then allowed to cool, when the timber is removed and allowed to drain. A simple drainage system may be made in the form of a platform of ordinary galvanised iron sloping towards the tank, the surplus liquid flowing back to the tank via the channels.

Timber should be as dry as possible before creosoting as, if the wood cells contain much water, penetration will be unsatisfactory. If timber is to be morticed or otherwise worked, this should be done before it goes into the tank; otherwise the cut surfaces, always more liable to collect water as joints, will form a very weak link in the chain. Timber should always be barked before immersion, for bark resists the preservative and, when it falls or rots off, leaves exposed an imperfectly treated surface. Well creosoted sapwood will last just as long as heartwood. Timber should never be removed from the tank while hot as considerable absorption takes place during the cooling period. Absorption will vary, but averages .75 gall. per cubic foot.

The pines, beech, elm and sappy oak all take creosote well. Larch, on the other hand, does not and it is possible that in this case heavy brushing is almost as good as boiling. Spruce, also, is worth creosoting. Although penetration is not nearly so good as with pine, there is no doubt that the life of this timber and of others such as black poplar, etc., is much increased by the treatment. The cost of impregnation for most timbers is about 4½d. per cubic foot.

With fence posts the most vulnerable portion is that below the soil, or more exactly that portion just above and just below ground level. For this type of timber the most economical method is the "butt treatment" in which only the lower end is treated. This is not entirely a new idea as it has been practised for years on hop poles in Kent. A new method of working this treatment, and one which should appeal to every farmer by reason of its simplicity and cheapness, is that known as the "oil drum" method, to which considerable publicity is being given by the British Wood Preserving Association. A plant can be established for well under £2. In this case the posts

are stood upright with their butts in a heavy steel oil drum of about 90 gallons capacity, obtainable for about 20s. Below this a short flue of a few bricks is made, the chimney being of stove piping. The period of heating is similar to that in the steeping process and the most convenient method is to leave the posts standing to cool over night, lifting them out in the morning. An inner plate with spikes or heavy nails may be placed in the bottom to keep the posts down. With Scots pine a regular absorption of 1 inch in depth, which is quite enough for all farm purposes, may be expected. With heavy posts lifting out may be found difficult, especially as regards the first few posts, and in this case a tripod with ropes and pulley will be found of great assistance. Failing this a small platform may be used. By this method a post can be satisfactorily treated for about $\frac{3}{4}d$.

When timber is to be used in any quantity a saw bench is essential, especially if the local mill is some distance away. Sawn stakes are better than split ones and hand cross-cutting is a slow process. The most useful type of saw bench is an iron one to take 30-inch circular saws capable of converting a 12-inch diameter butt, and therefore big enough for any ordinary farm purpose. Such a type can be purchased complete with saw for about £18 f.o.r. with a table marked in inches and with adjustable feet enabling the bench to be set up level on the roughest foundation. If rails are to be cut a temporary wooden extension can be easily fitted. An ordinary 6 h.p. oil engine will usually give the necessary power, but it is better to err on the side of too much power. Internal combustion engines are inclined to be jerky in action and steam or water power is distinctly better. Portable cross-cut saws, complete with motors, vary in price from £40 to £50. One well known type is claimed to cost no more than $2\frac{1}{2}d$. per hour to run and is said to be able to cut up 1 cwt. of logs in four minutes, dealing with timber up to 48 inches in girth.

FIREWOOD.

A considerable amount of waste wood, thinnings and odd poles is relegated to the firewood pile and a good deal more might be got out of such timber if more care were taken of it. As a general rule such wood lies in a heap in the open with but little chance to dry out, and wood suitable for burning in the house is mixed up with rotten stuff and other wood of very little heating power.

Heating power in wood depends very largely on its carbon content and this depends on the density, and hence on the weight. Most light woods are highly inflammable and give out

a bright flame, but for actual heating power it will be found that heavy, close-grained woods are by far the best ; naturally the drier they are the better they burn.

To make the best of it, firewood should be winter felled. It should be dried rapidly and if possible under cover, but under such cover as allows of a considerable amount of draught, especially from front to back. Stems before cross-cuttings should be laid as nearly parallel as possible and preferably in an upright position.

Firewood for sale is generally measured by the "cord"—fresh felled weighing about 30 cwt. and when seasoned about 21 cwt. When there is a surplus in the neighbourhood of towns the question of sale is worth considering, as there seems to be a definite increase in the number of middle-class householders who prefer wood to coal in their living rooms. There is no need to draw timber for this purpose to the homestead if a portable bench is available. The wood can be cut up in wet weather and left in a heap to dry out, protection being given by any type of emergency covering. Again the timber can be cut into lengths of from 4 to 6 feet and stacked till required, being sold in that state to firewood merchants who themselves do the actual cutting into firewood blocks. Such sales provide useful work for horse and man when the weather makes work on the land impossible.

As regards the actual value of the different species for firing, a well-known German classification is as follows :—

Greatest heating power : Beech, birch, old Scots pine.

Considerable heating power : Ash, elm, larch, oak.

Fair heating power : Spruce, Spanish chestnut, wych or Scots elm.

Poor heating power : Lime, alder, poplar and willow.

From the householder's point of view perhaps the best fuel is ash, especially when green. It burns smoothly, gives out great heat and is quiet. Holly is also very good, especially when green but seasoned, burning very quickly. Dry old oak is excellent, having great heating power and lasting a long time. Birch, on the other hand, burns away rapidly. Scots pine has a pleasant smell but burns fast. It is best in very large fireplaces and put on in large slabs. Larch throws out dangerous sparks and is a noisy crackling wood. The fruit trees, pear, apple and especially cherry, are excellent trees to burn and leave a pleasing scent behind them. Elm is a poor fuel as it has a dull, cheerless, smouldering flame. The worst of all is poplar, which burns with the greatest difficulty. Poplar is perhaps the most un-inflammable species in this country and on this account is often found useful for the floors of oast houses. Spruce burns badly.

In connection with firewood a note on splitting may be of interest. Timber may be split in two ways, either radially, that is in direct line with the centre and bark, or tangentially, *i.e.*, at right angles to the first method. In all cases the first method offers the least resistance. It is obvious that the straight-grained woods are easiest to split, and timber with short or twisted fibre the most difficult. The outer portions of a log are easier to split than the inner, owing to the greater tension in the outer part of the tree. Wet, underseasoned wood is split, as a rule, with more difficulty than dry wood, but in some cases moist timber gives the tool a better grip. It is for this reason that such trees as beech can be split more easily unseasoned than when dry; although moisture decreases the power of splitting easily, this is overbalanced in smooth-textured wood of this type by the extra grip obtained by the wedge. Generally speaking the easiest timbers to split are spruce, beech, the pines and larch. In the next class are oak, ash and chestnut, whilst the timbers offering the greatest resistance are elm (which has generally a twisted grain), hornbeam, goat willow and poplar. Timber is always more difficult to split in frosty weather than at other times. The presence of resin also reduces elasticity and consequently fissility; thus very old Scots pine butts, especially from near the ground, are, as a rule, particularly resistant to the wedge and beetle.

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THE CALCULATION OF THE ANNUAL COST OF FARM MACHINERY AND IMPLEMENTS.

MUCH is heard these days about the mechanisation of farming and it would appear that this movement is one which is likely to grow stronger and stronger as some measure of prosperity gradually returns to the farming industry. The fundamental object of mechanisation, whatever form it may take, is to bring about more economical production. This may be the result of either lower production costs per unit or higher selling values per unit; and although mechanisation may sometimes lead to higher selling values because it may enable quality to be improved¹ it is true, in the main, to say that the immediate

¹ The use of a tractor may enable barley to be sown earlier or on a better seed bed and hence malting quality may be higher than it would otherwise have been.

object of mechanisation is to reduce the unit costs of production. Whether this is accomplished by reducing the production costs per acre, or by increasing the yields per acre, or by both of these methods, does not matter from the point of view of this article. In either event, the cost of production per unit includes the cost of the machinery and implements and a brief consideration of the problem will show that the determination of the proper charge to be made on this account is by no means easy. Apart from this, there is some doubt as to whether the usual methods of dealing with ordinary farm machinery and implements for accounting purposes are as accurate as they might be; and it may be found that methods that were good enough for equipment of the pre-war kinds are liable to cause very significant errors when applied to large modern machines, such as tractors, milking machines and combine-harvesters. The greater the degree of mechanisation, the greater the relative importance of the machinery costs and therefore the more important it is to be able to determine these costs with the highest possible degree of accuracy. In the extreme case—the highly mechanised corn growing farm—the calculation of the annual cost of machinery becomes a matter of vital importance and this applies particularly during the experimental stages, if entirely misleading conclusions are not to be drawn.

CONSTITUENTS OF MACHINERY COST.

The total annual cost of machinery and implements falls under two chief heads, *viz.*: (1) *Running costs*, that is, those that depend mainly upon the amount of work done and (2) *Overhead costs*, that is, those that depend only to a small extent upon the amount of work done. Running costs may be subdivided into (a) ordinary repairs and small renewals and (b) consumable stores—petrol, paraffin, lubricating oil, grease, binder twine, etc.; while overhead costs may be subdivided into (a) depreciation and (b) interest on capital. These are the factors that constitute the machinery cost problem.¹

First of all, let us be quite clear on one point. The determination of the *total* cost of any machine *during its working life* is a comparatively simple matter: the real difficulty arises in apportioning this total cost over the different years. For example, a farmer buys a tractor for £200, works it for five years and then sells it for £25. A simple record will show the total running costs for repairs, paraffin, lubricating oil, etc., and hence the total cost of the tractor for five years can be easily and accurately found. It is in deciding how much of

¹ For practical purposes annual charges such as insurance, licences and sundry items would be included with repairs and renewals.

this total cost is to be charged in the first year, how much in the second, and so on, that the real problem arises, coupled with the fact that for accounting purposes decisions must be taken *before* the total cost is actually known.

Broadly speaking, the object should be to distribute the total cost in such a way that the *annual* costs are approximately equal. Thus, the cost of repairs and renewals may be expected to increase gradually as a machine gets older and in the case of tractors and motor lorries the consumption of fuel and oil is also likely to be somewhat higher for old than for new machines. This being so, the method of calculation adopted for depreciation or interest, or both, should give diminishing charges for one or other or both of these items as the machinery gets older. Nevertheless, since new machines will generally do rather better work than old ones the tendency should be towards slightly diminishing total annual costs; at any rate, it is better to charge too much in the early years of a machine's life than to charge too little and then find that either the charges must be increased in the later years or the machine sold or scrapped at a price considerably below its book value, that is, at a loss. Let us now consider the different cost items one by one.

REPAIRS AND RENEWALS.

For practical reasons, it is necessary to take the cost of repairs and small renewals year by year just as they are made. Theoretically, the total cost of these items during the machine's working life might be divided equally over the different years but it is extremely difficult to forecast, with any degree of accuracy, what the repairs and renewals for any machine are likely to cost and it is of course impossible to wait until the actual cost has been found. Hence, the almost invariable practice is to charge against each year the cost of repairs and small renewals incurred during that year and this as a rule is merely a matter of accounting.

There are, however, cases where it would not be reasonable to charge the whole cost of repairs against the year in which they have been made. For example, an old waggon is sent to the wheelwright to be completely overhauled and in due course a bill for, say, £30 is received. A common-sense view would be that the waggon is now almost as good as new and for accounting purposes it may very properly be treated as a new waggon, that is, the cost of what are actually repairs is taken as capital expenditure on a "new" waggon and is not charged against the waggons as repairs. Such cases, however, are not very common and if there is any doubt the repairs account should always be charged.

CONSUMABLE STORES.

In the case of petrol, paraffin, lubricating oil, grease, and other consumable stores there is no difficulty. The cost of whatever is used in any one year can be charged without hesitation against that year's accounts and the matter is finished. Quite simple accounting records will suffice to show the charge to be made against any one machine or group of machines.

DEPRECIATION.

Depreciation on any mechanical unit refers to the gradual decrease in value from the time it is purchased until it is thrown on the scrap heap.

Causes of Depreciation. The chief cause of depreciation is, of course, what is commonly called *wear and tear* through usage and this at once suggests that the *rate* of depreciation will depend upon (a) the amount of work done each year—a tractor working 1,500 hours a year will depreciate more rapidly than one working only 500 hours; (b) the attention given to the machine while it is working—inefficient lubrication is a common cause of excessive depreciation; (c) the care taken of the machine while it is idle—a plough that is used for part of the year to fill a gap in a hedge will suffer avoidable depreciation; and (d) the promptitude with which necessary repairs are made—a cutter bar not in proper alignment will set up severe stresses and strains throughout the machine. At the same time, it must be kept in mind that, unless it receives some special treatment, a machine suffers physical deterioration even when it is standing idle. It is this physical deterioration, whether due to use, mis-use or non-use, that is generally associated with the term depreciation and regarded as its principal cause.

But there is another common cause of depreciation. Take the case of the Scotch swing plough. About thirty years ago this was largely replaced by the chilled plough and hundreds of swing ploughs were scrapped, not because they were worn out in the physical sense, but because they became out-of-date, in other words, obsolescent. This factor of *obsolescence* is very difficult to measure, but it is none the less real and has been responsible for a considerable amount of depreciation on farm machinery and implements during the last forty years. And it should be noted that, until recently, the chief effect of inventions was the substitution of one fairly simple machine for another—the reaper for the scythe, the horse rake for the hand rake, the chilled for the swing plough—whereas the present tendency is to substitute a large, complicated, expensive machine for a number of simple machines—the tractor plough for several horse ploughs, the combine-harvester for several self-binders—and, in addition, machines are being

more and more widely used to supplant manual labour—the mechanical cabbage planter for a gang of workers, the hay loader, tractor sweep and elevator for numerous pitchers and loaders, the milking machine for several hand milkers. It is fairly clear that in trying to forecast the value of any machine ten or twenty years hence we cannot afford altogether to ignore the possibility that it will be out of date in five years, and therefore of less value, no matter whether it is sold or retained for further use.

There is, however, still a third way in which machinery can suffer "a decrease in value," but whether this kind of decrease can rightly be regarded as a part of depreciation is rather a debatable point. Take the case of the farmer who bought a self-binder shortly after the war for £70. He proceeded to write off depreciation at the rate of 10 per cent. per annum and in eight years' time it stood in his books at £30. Meanwhile, the price of self-binders fell heavily and he found that although his eight-year-old machine was valued at £30 a new one could be bought for £40. Under such circumstances, a "re-valuation" is made with the object of bringing the book values of old machines into line with the current prices of new ones and the old binder is "re-valued" at £15, thus showing a "loss" of £15. The question is: should that £15 be called depreciation and added to the ordinary charges for depreciation or must it be regarded as a capital loss due to the general fall in the price level? On the one hand, it can be urged that this form of decrease in value is due essentially to a rise in the value of money and not to a decrease in the value of the machine, as a machine; on the other, it can be said that from the farmer's point of view the "loss" is just as real as if it had been incurred in the usual way. There is of course nothing to prevent the above farmer carrying on as if the general fall in prices had not taken place, that is, he might continue to depreciate his binder on the usual scale until it was actually scrapped. In this way, he would merely postpone the evil day and in addition he would have the uncomfortable feeling that this particular asset in his balance sheet was partly fictitious. Whatever method is followed, it is fairly certain that in calculating the *annual* cost of depreciation no provision can be made for either falling or rising values of new machinery—any "losses" or "profits" incurred on that account should be taken as special items to the profit and loss account and not brought into the ordinary cost calculations at all.¹

¹ It can be argued that such items should be regarded as capital losses or profits and taken to the capital rather than to the profit and loss account. The point is too academic for full discussion here and does not affect the question at issue.

This aspect of depreciation has been mentioned because it has been much in evidence in recent years, but for the remainder of this article it will be ignored. It is safe to say that machinery will depreciate through usage, it is feasible to allow for the possibility of a machine becoming obsolescent before it is worn out, but it is quite impossible to forecast, with any reasonable degree of accuracy, whether the general level of machinery prices is going to be higher or lower in five, ten or twenty years' time.

The foregoing discussion of the causes of depreciation should make it quite clear that the calculation of the amount to be charged in any single year in any given case is a matter of judgment and common sense rather than of fixed rules and regulations. The essential problem can be very simply stated. A plough is bought at 1st October, 1931, for £6; during the year 1931-32 *some* depreciation occurs. The problem is: How much? How is the amount of depreciation in 1931-32 to be calculated? Substitute £600 or £6,000 for £6 and a complete outfit of machinery and implements for the plough and the problem appears in better perspective. The depreciation problem arises essentially out of the fact that machines generally work for longer than one year, coupled with the fact that for practical reasons accounts are generally made up on the basis of one year.

Book Values. In trying to solve this problem, there is one other general point that requires consideration. Ordinarily, the assets of any business appear in the balance sheet at *not more* than their current market value and it may be asked: why not value machinery just in the same way as other assets are valued and thus automatically arrive at the amount of depreciation? The answer is that once a machine has been used, even for a day or two, its market value has no relation to its work value—a self-binder that has been in use for one season ought to be still as good as new from a work point of view, but in the open market it is worth considerably less than its cost price. The usual procedure, therefore, is to arrive at the balance sheet value of machinery by “writing off” a certain amount for depreciation from the cost price or previous valuation figure. Hence, we find the term “book-values” used to describe the prices that are attached to machinery and implements for balance sheet purposes. The point here, of course, is that a method of calculating depreciation cannot fairly be criticised because it leaves the machinery standing in the balance sheet at, it may be, considerably more than it is worth in the market. It is only under special circumstances, such as those mentioned above, that it may be advisable to make a *direct* valuation of this asset.

These preliminary considerations have been discussed at

some length because they are necessary to a proper understanding of the depreciation problem. Now let us tackle the problem itself. It is two-fold.

The Working Life. First, we must determine as best we can the *total* depreciation on any machine (or group of machines) and, second, we must decide how this total depreciation is to be apportioned over the machine's useful life. A tractor is bought for £200 on 1st October, 1931. What is the total depreciation likely to be? This will depend upon whether the tractor is worked right out, in which case the scrap value may be £20 (or less) and the total depreciation £180 (or more), or whether it is replaced by a new tractor while it is still in reasonably good working condition, in which case the scrap value may be £40 (or more) and the total depreciation £160 (or less). In most cases, however, it can safely be assumed that the intention will be to use the machine as long as it can do useful work, that is, all that is necessary is to estimate the machine's probable *working life*, and allow only a very nominal sum for scrap value. As a rule, this estimate can be based upon previous experience with the same class of machine, but with modern machines, such as combine-harvesters, it is specially difficult to decide what "life" should be allowed. Further, for strict accounting, which always deals with particular cases, the probable length of life should be estimated having regard to the local conditions under which the machine will be working. It may be quite true that the *average* working life of a tractor is five years and it is attractively easy to use this average in every case, but this is merely begging the question. Conditions are *not* the same and, if really useful results are to be obtained, we should not assume that they are.

The bearing of the obsolescence factor upon the probable working life of any machine has already been discussed. The best that one can do is to avoid taking too sanguine a view: it is better to keep on the safe side, in the financial sense, and to under-estimate rather than over-estimate the length of life of any machine. Just as there is a tendency to claim too much for new methods and systems in farming so the temptation to over-estimate the working life of a new machine is very great.

There remains the second-hand machine. A farmer buys an old tractor for £50; he can easily find out how old it is, but he will not know exactly how it has been handled under its previous owner. In such a case, the sound policy is to give the machine a short life and get it written down to scrap value as quickly as possible.

Apportionment of Depreciation. Now suppose that the total depreciation on a certain machine over a ten-years' life is estimated to be £100, that is, cost price minus scrap value,

on what basis is this amount to be apportioned over the ten years? If nothing but depreciation was involved, then we might say at once that the total amount should be distributed equally over the ten years. Or, alternatively, the total amount of *work* (acres ploughed, acres "combined," miles run, etc.) likely to be done in the estimated life might be also estimated and the annual depreciation charged on the basis of the amount done in each year. But since the ultimate object is to divide the *total* cost of the machine as fairly as possible over its working life and bearing in mind what has already been said about the running costs, it is clear that this method would result in the total charges becoming heavier and heavier as the machine grew older. This "Fixed Instalment" or "Original Cost" method of calculating annual depreciation cannot therefore be recommended for farm machinery and implements, since it violates one of the essential conditions of any satisfactory method.

This conclusion is really fundamental to the general argument of this paper. Should it be questioned, it may be pointed out that if total costs *are* lowest in the early years of a machine's life then it would seem that the farmer could reduce his production costs by always working with new machines. The fallacy here, of course, is that the costs of the early years *appear* low only because the book values are maintained at a fictitious level, that is, the costs would be low *provided* the book values could be realised in the event of the machine being exchanged for a new one, and this, in the great majority of cases, would be clearly impossible.¹

Under the fixed instalment method, the agreed rate for depreciation is always calculated on the *original cost*, but if it is calculated on the *book value* at the beginning of each year the annual charge for depreciation will be on a diminishing scale as the machine gets older. This is called the "Reducing Instalment" or the "Diminishing Value" method of depreciation and is the method usually to be preferred. In practice, however, this method is almost invariably misunderstood. It is assumed that a ten per cent. rate for depreciation by the diminishing value method means a ten-years' life and that a five per cent. rate means a twenty-years' life. Actually, it would take 58 years to write down a £100 machine to a scrap value of £5 at 5 per cent. per annum by the diminishing value method!² Again and again farmers (and others) have pro-

¹ A £200 tractor would not likely be worth £155 (£200 less 22½ per cent. depreciation) in part payment of a new machine after working for a year.

² Thus,

Value at end of 1st Year=£100 : 0 : 0, less 5%, i.e. £5 : 0 : 0=	£95 : 0 : 0.
" " " " 2nd " £95 : 0 : 0, less 5%, i.e. £4 : 15 : 0=	£90 : 5 : 0.
" " " " 3rd " £90 : 5 : 0, less 5%, i.e. £4 : 10 : 3=	£85 : 14 : 9.

and so it would take an infinity of years to reach nothing.

tested to the writer that a ten per cent. rate for depreciation on ordinary farm machinery is too high, because, they say, such machinery will last for more than ten years, oblivious of the fact that, using the diminishing value method, it takes no less than 22 years to write down £100 worth of machinery, not to nothing, but to a scrap value of £10, at the rate of 10 per cent. per annum. Indeed, there does not seem to be any doubt that this misunderstanding of how the usual method of calculating depreciation actually works out is responsible for the rates commonly prescribed to, and accepted by, farmers being too low, with the result that the book values of machinery in the balance sheet are maintained at too high a level; in other words, the annual cost of depreciation is under-estimated.

Calculation of Depreciation. Fortunately, it is a misunderstanding that is easily corrected, even though correction does involve a complicated-looking mathematical formula, not easily solved without a book of logarithms. The general principle is quite simple. We are "given" three things: (1) the cost price of the machine (or group of machines), (2) the estimated scrap value, (3) the estimated working life, and we have to "find" (4) the rate per cent. which, on the diminishing value basis, will bring the original cost down to the scrap value in the given number of years. For example, a tractor costs £200, it is given a scrap value of £25 and a working life of 5 years, what rate of depreciation should be used? The answer is 34.02, or say 34 per cent. There is no need for the practical man to bother about the formula¹; once the principle is accepted a schedule can be drawn up in a few minutes, with the help of a mathematically minded friend, to include all the rates that are likely to be required. (See Appendix.)

To summarise, the procedure to follow in calculating the annual charge for depreciation on any machine or group of machines by the diminishing value method should be as follows:-

(1) Estimate the probable working life, having regard to (a) wear and tear, and (b) obsolescence;

(2) Estimate the scrap value, according to whether (a) the machine is to be worn right out and worth only "old iron" price, or (b) it is to be used in part payment of a new machine while it is still fit to do some work;

(3) From the schedule of depreciation rates, find the rate per cent. which will enable the scrap value to be reached at the end of the estimated working life.

Criticism of Existing Method. The existing method of depreciating farm machinery is, however, very firmly entrenched

¹ Which is, Rate per cent. = $100 - 100 \sqrt[n]{\frac{RV}{P}}$, where P = original cost or book value, RV = scrap value, n = number of years' life.

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and it is necessary to consider in some detail its inherent weaknesses, having always in mind the increasing importance of machinery costs in agricultural production. The usual method of depreciating "ordinary" farm machinery and implements is illustrated below :

	£
Valuation at Michaelmas 1931	500
Add implements purchased in 1931-32	30
	<hr/>
	530
Deduct „ sold in 1931-32	10
	<hr/>
	520
Less depreciation at 10 per cent.	52
	<hr/>
Valuation at Michaelmas 1932	468
Purchases and sales in 1932-33—Nil	
Less depreciation at 10 per cent.	47
	<hr/>
Valuation at Michaelmas 1933	421
	<hr/>

And so on from year to year.

All the larger units—tractors, threshers, motor lorries, combine-harvesters, etc.—are usually treated separately but on the same lines, although, of course, different rates of depreciation are used, for example, 5 per cent. on a thresher, 20 per cent. on a motor lorry and 22½ per cent. on a tractor. In some cases, the depreciation is reckoned on the valuation, less sales, and the purchases taken at the end of the year at cost price ; in others, the depreciation on the new implements is reckoned according to the time when purchased ; but these are merely refinements of the same general method and the final results would not usually differ very much.

What is generally a minor, but is sometimes a serious, criticism against the above method arises from the way in which the sales of implements are treated. Take the following example :

	£
Book value of old self-binder at Michaelmas 1931	12
Add cost price of new binder, July 1932	45
	<hr/>
	57
Deduct sale of old binder	5
	<hr/>
	52
Less 10 per cent. depreciation	5.2
	<hr/>
∴ Valuation of new self-binder at Michaelmas 1932	=46.8
	<hr/>

The result is that the new binder, after cutting the 1932 corn crop, is valued at 36s. more than it cost, which is palpably absurd. In an actual case, in which certain barn machinery

was included in the general total, calculation showed that its book value at a certain date was £33. It was sold for £15, but the next valuation still included barn machinery, which was non-existent, to the value of £16 4s. 0d., thus :

Book value	£ 33
Less sales	15
	<hr/>
	18
Less 10 per cent. depreciation	1.8
	<hr/>
∴ Book value	=16.2

Then there is also the old machine—reaper, binder, hay tedder, etc.—which is scrapped without any attempt being made to find whether it has already been fully depreciated, with the result that the current book value may include a certain amount for machines that have been permanently thrown on the scrap heap.

Now, as will be shown later, there is no reason why such mistakes should occur, because with a little trouble they can be easily obviated ; the point is that this little extra trouble is seldom, if ever, taken and the result again is that book values are maintained at too high levels. It may be suggested that the easy method to check up the book values is to have a re-valuation every five years or so, but it must be emphasised that this is merely an open confession that there is something seriously wrong with the procedure in regard to depreciation ; it means in effect that the *annual* charges for depreciation are likely to be of very doubtful accuracy, and it is these annual charges that form the subject of this discussion.

What has been said immediately above applies mainly to the valuation of *groups* of machines, but even in the case of separate machines there is often some doubt as to the correct procedure. For example, at Michaelmas 1931 an old tractor has a book-value of £65. In October, 1931, this tractor is sold for £50 and a new one purchased for £200. How should the new tractor be valued at Michaelmas, 1932 ?

WRONG METHOD.

	£
Value of old tractor at Mich. 1931	65
Add new tractor purchased	200
	<hr/>
	265
Deduct old tractor sold	50
	<hr/>
	215
Less 22½% depreciation	48.4
	<hr/>
Value of new tractor, Mich. 1932	£166.6

RIGHT METHOD.

	£
Value of old tractor	65
Sale of „ „	50
	<hr/>
Extra depreciation (carried to P & L a/c)	15
	<hr/>
Cost of new tractor	200
Less 22½% depreciation	45
	<hr/>
Value of new tractor, Mich. 1932	£155

One great advantage of depreciating all the larger machines separately is that, sooner or later, definite evidence is obtained to show whether the rate of depreciation charged has been too low or too high. In this case, the depreciation on the old tractor has been under-estimated to the extent of £15 and, other things equal, there is, therefore, good reason for depreciating the new tractor at a higher rate. It is only on such lines that a basis for getting out reasonably accurate annual charges for depreciation can be found.

The second objection to the usual method of dealing with depreciation is much more serious and centres round the percentage rates. So far as the accountant is concerned he accepts the current rates¹ simply and solely because they are approved by the Inland Revenue Department for Income Tax purposes ; as for the farmer there is every reason to believe that he accepts them because he is under the false impression that a 10 per cent. rate means a ten years' life, a 5 per cent. rate a twenty years' life and so on. The differences between the usual method of depreciation and the improved method suggested above can be clearly shown by means of a few examples.

A tractor is bought for £200, it is estimated that, having regard to the conditions under which it will have to work, its useful life will be five years and that it will then be worth £25 for "part payment" purposes. On this basis, the depreciation rate is 34 per cent. per annum. Under the usual method, 22½ per cent. will be written off annually. The comparative results are as follows :—

	Usual Method.	Improved Method.
	£	£
Original cost	200	200
Depreciation rate per cent.	— 22½	— 34
Depreciation in 1st year	45	68
" " 2nd "	34·9	44·9
" " 3rd "	27·3	29·5
" " 4th "	20·9	19·6
" " 5th "	16·2	13·0
Total depreciation	144·3	175·0
Book value after 5 years	55·7	25·0

There seems to be no doubt that the suggested method gives much more rational results than the usual method : the depreciation does occur mainly in the first two years, the tractor is not likely to be worth more than £25 after five years'

¹ The chief of these are : Fixed plant, threshers, steam boilers and engines, 5 per cent. ; tractors, 22½ per cent. ; steam lorries, 15 per cent. ; motor lorries, 20 per cent. ; all other types of farm machinery and implements, including poultry houses and incubators, 10 per cent. No information is available as to the basis of these rates.

fairly steady work, while the cost of repairs and renewals, fuel and oil, is almost certain to be much higher in the last two than in the first two years of the tractor's life.

Or take the case of general farm machinery for which a rate of 10 per cent. is usually taken. We start with, say, £600 worth, give it a 10-years life and a scrap value of £60. Under the improved method this would mean a rate of 20·57 or say 20 per cent. Under the usual method this equipment would still have a book value of £209 after 10 years, compared with £60 with the suggested method. Is there any doubt as to which method best satisfies the requirements of conservative and safe finance?

Lastly, take a threshing machine costing £150. It is written down at the usual rate of 5 per cent. and in twenty years' time it still has a book value of £54. Is it reasonable to anticipate that after twenty years a thresher will still be worth nearly one-third of its cost price? Only an optimist would think so. Would it not be much safer to give it a scrap value of about £15 after twenty years and then write it down by 10·87 or say 11 per cent. per annum?

Let it be quite clearly understood that the chief object of this analysis is to establish general principles. It is not suggested that the average life of a tractor on the farm is necessarily five years or that ten years is necessarily the correct length of life for all ordinary equipment—ploughs and harrows, carts and waggons, self-binders and potato-diggers and so on. What is suggested is that the rate of depreciation should be fixed on some definite basis and that the only rational basis is the estimated working life, together with the estimated scrap value at the end of that life. It is not a question of squeezing the maximum possible allowance for wear and tear and obsolescence out of the Inland Revenue Department, but of devising some method by which the total annual cost of machinery and implements in agricultural production can be calculated with reasonable accuracy. The usual method under-estimates depreciation, inflates book values and results in production costs being under-stated, especially where machinery is used on a large scale.

Procedure on the Farm.

Let us next consider briefly how this depreciation problem should be tackled on the ordinary mixed farm, taking comfort from the thought that it is a problem which comes up only once every twelve months.

(1) Make a detailed inventory and valuation of all machinery and implements on the farm. This would be done

'in the rough' and no attempt would be made at classification. It would probably be best to get the services of a local valuer who was in touch with the usual valuations of second-hand farm equipment, but the valuer should be supplied with the cost prices of all machines recently purchased. It is this detailed valuation that is the foundation for what follows and since it has to be done only *once* it is worth while taking some trouble over it. It should of course be done within a day or two of the date of the annual Balance Sheet.

(2) Next proceed to make a classification of this detailed valuation on the following lines :

- (a) List all the larger and more costly items separately—
the tractor, the thresher, the motor lorry, the milking machine, the barn engine, and so on.
- (b) Classify the remaining items into groups, *e.g.* :—
 - Harness and stable equipment.
 - Dairy utensils—churns, pails, etc.
 - Sheep equipment—troughs, gates, corn bins, etc.
 - Pig equipment—troughs, bins, etc.
 - Poultry equipment—houses, netting, incubators, etc.
 - Field Implements¹—ploughs, harrows, reapers, binders, haying implements, etc., etc.
 - Carts and waggons.
 - Barn machinery—corn crushers, cake breakers, root cutters and pulpers, etc.
 - Sundry small equipment—ladders, forks, rakes, scythes, spades, etc., etc.

In making this classification it is always well to keep in mind that it may be desirable to use different rates of depreciation for different groups.

(3) Decide upon (a) the probable scrap value and (b) the probable working life of each separate machine or group of machines, and then find the rate of depreciation in each case. (*See Appendix.*)

In the case of "sundry small equipment," the simplest plan is to charge all purchases of such equipment as renewals, along with repairs, and to maintain the valuation at a constant figure, unless there should be any marked increase or decrease in the number of these things in use.

(4) In the case of single units, purchases and sales present no difficulty, *e.g.*, if a new tractor is bought this would be kept separate and the old tractor written off the books as already indicated.

Purchases belonging to any one of the groups would be added on as already indicated, but in the case of sales from any

¹ Implements used only with a tractor should be put in a separate sub-section.

one of the groups a calculation should be made in order to find the book value of the implement sold (at the date when it is sold) and it is this book value rather than the amount realised which should be deducted from the group valuation—any difference being carried to the debit (or credit) of the Profit and Loss Account. Similar treatment should be given to any implements that may be scrapped during the year.

(5) For the great majority of farmers, elaborate forms are best avoided, even at the expense of a little extra paper and ink. Hence, it will generally be better to use a separate book for the valuations and to take a separate page for each machine or group of machines. Here, for example, is a sample page as it would appear in three years' time :

FIELD IMPLEMENTS.					
<i>Valuation Price</i>	.	.	.	£550 (as per (2) above).	
<i>Scrap Value</i>	.	.	.	£50	
<i>Working Life</i>	.	.	.	12 years.	
<i>Depreciation Rate</i>	.	.	.	18 per cent.	
					£
Value at Michaelmas 1930	.	.	.	.	550
Less depreciation	.	.	.	.	99
					<hr/>
Value at Michaelmas 1931	.	.	.	.	451
Add purchases in 1931-32	.	.	.	.	45
					<hr/>
Less depreciation	.	.	.	.	496
					89
					<hr/>
Value at Michaelmas 1932	.	.	.	.	407
Less sales in 1932-33	.	.	.	.	20
Accumulated depreciation	.	.	.	.	5
					<hr/>
					25 ¹
					<hr/>
Less depreciation	.	.	.	.	382
					69
					<hr/>
Value at Michaelmas 1933	.	.	.	.	313
					<hr/>

All this may appear very complicated; actually, it is perfectly simple and straightforward once the foundation has been laid in the shape of (a) a detailed valuation of all equipment and (b) a schedule of depreciation rates. After the system is set going it is a matter of a few minutes' work once a year, and the farmer would have before him a complete financial history of his machinery and implements, the value of which would grow steadily from year to year. It is only by following such a system that it is possible to obtain reliable information as

¹ Calculation, based on the detailed valuation at Michaelmas 1930, showed that the book value of the implements sold was £25. The difference of £5 is taken to the debit of profit and loss account.

to what the depreciation on any machine or group of machines has actually been, and in the course of time this information would be of very great value in the forecasting of probable scrap values and working lives.

INTEREST ON CAPITAL.

There is nowadays very seldom any doubt as to whether or not depreciation on equipment is a legitimate charge in production costs, but this is not so in the case of interest on the capital invested in that equipment. It would take us far outside the scope of this article to discuss the numerous economic and accounting questions that are here involved. After all, the differences of opinion are not fundamental, but arise from differences in terminology: the accountant defines "cost" in one way, the economist in another, and no doubt each definition is best suited to the respective purposes of accountant and economist.¹

Putting economic and accounting theories aside, therefore, let us consider this quite simple question: In comparing costs of production with machinery and without it, with an old-fashioned reaper and a modern combine-harvesting outfit, with horses and carts and a motor-lorry, with hand milkers and a milking machine, is it necessary or advisable to include in our calculations a charge for interest on the capital sunk in the machinery? If the answer is in the affirmative, a second question at once arises: On what basis should the interest charge be calculated? And there is no use begging the first question merely because the second occasions certain practical difficulties.

Take first the case of milk production. Three farmers, A, B and C, have 35 cows each. A milks by hand, B milks with a machine for which he paid £160 out of his savings, while C uses a machine for which he paid by borrowing £160 at 5 per cent. per annum. With hand milking it can hardly be said that any capital investment is required since the milkers' wages can be paid out of the current milk cheques, but in the case of Farmer C can it be denied that the machine costs £8 in the shape of interest or that in comparing the *total* cost of milking on these two farms this £8 must be included in C's costs? To say that this £8 is an appropriation of profit rather than a production cost is, to the plain man, a mere quibble. Is it not more than likely that if farmers could instal milking machines without having to pay interest on the capital expenditure more of them would be installed? Now what difference

¹ Perhaps the best discussion of this subject is to be found in *Economics for the Accountant*, by Kemper Simpson (Appleton & Co.).

does it make where the farmer is able to pay for the machine out of his savings, that is, without directly paying interest? The answer is that from a milk production point of view it makes no difference at all. Perhaps the point can be most easily seen by supposing that Farmer C came into a legacy and was therefore able to pay off the loan of £160. Is it commonsense to conclude that in that event his milk production cost would be decreased by £8 and his profit increased by a like amount? Hence a fair comparison of A and C calls for the inclusion of interest in C's costs; comparison of B and C shows that if interest is to be included when it is paid it should also be included even though it is not paid.

Take a second case. Farmer A continues to make hay with the usual assortment of general purpose implements—the horse-drawn mower and rake, the carts and waggons, the elevator, etc.; while Farmer B has a variety of special haymaking implements—the swathe-turner or tedder, the horse or tractor hay sweep, the hay loader, and so on. Is there any doubt that *one* of the reasons why Farmer A sticks to his old-fashioned outfit is that he has not got the necessary capital to buy the more modern machines? And it is partly because he cannot get this additional capital without paying interest on it that he continues to make hay by the sweat of his brow. Tell that farmer that the cost of the extra capital would have nothing whatever to do with his production cost for hay and what would he say, or think?

The case can be put more generally by saying that capital is just as necessary in production as land and labour and from a production point of view it is quite immaterial whether the land is rented or owned by the farmer, whether the labour is hired or provided by the farmer and his household, whether the capital is the private capital of the farmer or borrowed from someone else. *Comparative* costs must include fair charges for land, labour and capital no matter from what source these may be derived and it is comparative costs with which this article is concerned.¹

Passing now to the second question about interest: On what basis should it be calculated? The *rate* of interest on any investment depends partly upon its "safeness" and we can regard machinery as being a moderately safe form of investment. It is clear, however, that the safeness of the

¹ Two "red herrings" may be mentioned here. First, it is said that interest on capital cannot be included in costs because the Income Tax authorities will not "allow" it. This is a complete confusion of the issue. "Income" and "Profit" are *not* synonymous. Second, it is said that farmers invariably want to include interest in their costs so that they can make out a better claim to higher prices. But very few farmers nowadays believe that there is any connection at all between *current* costs and *current* prices.

"investment" in machinery depends to a certain extent upon the rates charged for depreciation: the higher the rate of depreciation the safer is the investment since there is less risk of the machinery having to be scrapped before its estimated working life has been fully exhausted. At the present time, an interest rate of between 4 and 5 per cent. will cover most cases.

As regards the determination of the *amount* on which the interest is to be calculated this should cause no difficulty if the suggested method of dealing with depreciation is adopted. The valuation book will show for each machine or group of machines the (estimated) capital "investment" at the beginning of each year and allowance can easily be made for any purchases or sales there may have been during the year. In fact, there is no reason why the valuation book should not have separate columns in which the interest charges could be shown year by year. This method may be questioned on two grounds.

First, it may quite fairly be asked: If a farmer buys a tractor for £200 with money borrowed at 5 per cent., should the annual interest charge not be based upon the amount of interest actually paid each year? This question arises from a misunderstanding of what actually happens. At the time of purchase the farmer invests £200 in the farm in the form of a tractor. During its first year's working, part of the capital value of the tractor will be exhausted—hence a tractor is called a "wasting" asset—and with a depreciation rate of 34 per cent. only £132 will remain at the end of the year. In effect, the *farm* has paid back £68 of the capital invested in it and interest can be charged against the farm only upon what remains. Hence, it is quite sound in principle to charge interest upon the book values at the beginning of each year. (Strictly speaking, interest should be calculated upon a *daily* rather than upon a yearly basis, but for practical reasons this is scarcely possible.)

Second, it may be suggested that since both depreciation and interest will be charged on a gradually diminishing scale, then, in spite of the fact that running costs will be incurred on an increasing scale, the tendency will be towards gradually decreasing total costs for depreciation, interest, repairs and stores. This, indeed, is quite true, but it can be justified because as a general rule the machine will do better work in its early than in its declining years; the efficiency of old machines is apt to suffer from the fact that they are less dependable than new ones and more liable to breakdowns of one kind or another—who has not seen harvest operations slowed down or held up because of "trouble" with an old binder? At the best, the annual charges for machinery are

to a large extent estimates, and, this being so it is much better to keep on the safe side, that is, to over-estimate rather than to under-estimate the cost while the machinery is in its prime.¹

ACCOUNTING WORK.

It is neither necessary nor desirable to go at all fully into the purely counting-house aspects of machinery costing. Once the general principles are accepted, there are no serious difficulties in the way of putting them into practice by means of formal accounts. But sufficient must be said to indicate how the accounts should be constructed in order to give the information desired.

Keeping firmly in mind that the immediate object is to determine the *total annual cost* of each machine or group of machines, the first question is: How many accounts are required? Each of the larger units—the tractor, motor-lorry and so on—must have a separate account since it is for such machines that reliable costs are most urgently wanted. And there is really no reason, except that a little more paper will be used, why each of the groups of machines above mentioned (p. 58) should not also have its separate account. Separation makes for clarity and separate accounts have far more to *tell* the farmer than composite accounts. Further, as soon as we come to the second objective, to be discussed below, we shall find that separate accounts are extremely helpful, if not indeed essential. Now consider the various cost items.

The great majority of the items in the bills for repairs and small renewals can be allocated to the proper accounts without any difficulty, while the more or less general items can be charged against sundry equipment. Insurances and licences can also be allocated without much trouble. Consumable stores, on the other hand, require a certain amount of "booking" if they are to be charged to the appropriate accounts with reasonable accuracy. All that need be said here is that where modern machines are in use—and it is these machines that consume most of the stores—it is imperative, if leakages are to be avoided, that a systematic record of stores used should be kept by some responsible person. This record would show, for example, how much petrol was used by the tractor, the motor lorry, the milking machine engine and perhaps the farmer's car; how much paraffin was used by the tractor, in the stable and cowsheds for lighting, and in the

¹ For a method of combining depreciation and interest in a single annual charge see article by the present writer in the *Journal of the Yorkshire Agricultural Society*, 1931. This method is suitable where the running costs do not vary much from year to year. The milking machine outfit is perhaps the only important example.

farm house. Depreciation and interest have simply to be transferred from the valuation book, if the suggestions put forward above are adopted.

At the end of the year, each machinery account would then show at a glance (on the debit side) the total charges for repairs and renewals, stores, depreciation and interest, and a sure foundation would be laid on which the farmer could proceed to make various calculations of comparative costs, such as the total cost of cowshed labour and equipment with and without a milking machine, the total cost of labour and equipment with and without a tractor, and so on. It is these supplementary calculations rather than the accounts themselves, that justify the time spent in keeping accounts. Making up accounts without thereafter making calculations and comparisons is like laying the foundation and then omitting to build the house.

APPORTIONMENT OF MACHINERY COSTS.

So far we have been considering how to arrive at the total annual charges for repairs and renewals, consumable stores, depreciation and interest on any machine or group of machines, and in ordinary financial accounting nothing more is required. But in any system of cost, departmental or enterprise accounting, in which the object is to show the separate costs and profits for different sections of the farm, it is necessary to apportion the total charges over the various sections. For example, with a tractor the first and most important question is: What is the total cost of the tractor for the year? The second question is: How much of that total cost has been incurred on behalf of potatoes, wheat, sugar beet and so on? And it is clear that in trying to compare production costs with or without machinery or with pre-war and modern machinery a certain amount of apportionment of total costs will generally be required; for example, we may want to know the cost of growing wheat (*a*) with men, horses and pre-war machines (self-binders, carts and waggons, etc.), and (*b*) with men, (horses), and modern machines (combine-harvester outfit, motor lorry and drying plant).

The live stock machinery is easily dealt with. Thus, the total charges on harness and stable equipment are a direct charge against horses and horse labour, the total cost of dairy equipment a direct charge against milk production. The total cost of cowshed labour, together with various assortments of equipment, could then be established and useful comparisons made.

As regards the large class of horse-drawn implements—carts, waggons, ploughs, cultivators, self-binders, etc.—the

total charges can be apportioned with reasonable accuracy on the basis of the number of horse-hours spent on each crop, etc. (This, of course, pre-supposes the keeping of regular time sheets on which the horse hours would be recorded.) Admittedly, this apportionment can be only approximately accurate, but the amount of horse labour is the only practicable measure of the amount of "work" done by these implements. Difficulties will arise; for example, an elevator may be driven by a petrol engine and in such a case the simplest plan would be to take the elevator as a separate machine. The man on the spot knows exactly how each machine has been used and should have no difficulty in making such variations as may be required in special cases.

Third, the charges against barn machinery must be apportioned on a more or less arbitrary basis according to the way in which it has been used—so much against the various classes of live stock for grinding corn, cracking cake, pulping roots and so on. Small equipment and tools must be treated on similar lines. It is always well to remember that the total amount to be apportioned under these two heads will not usually be very large so that any errors that may occur will have an insignificant effect upon the total costs of production of crops, etc.

Lastly, there is the tractor and tractor-drawn machinery, the motor-lorry and other large machines for which separate accounts will be kept. In the case of all machines in the working of which fuel (petrol, paraffin, etc.) and oil are consumed three bases of apportionment are available, *viz.* (a) the number of hours worked on each crop, etc.—the *time-basis*, (b) the consumption of fuel and oil on each crop, etc.—the *fuel-basis*, and (c) the amount of work done as measured by miles run, acres ploughed, acres harvested, etc.—the *work-basis*.

It is likely that if reliable results are to be obtained some combination of these methods will have to be used. For example, with a motor-lorry that is used almost entirely for road haulage purposes, the cost can be apportioned with reasonable accuracy on a mileage basis; but this basis is less suitable where the lorry is also used for work in the fields, such as hauling silage or corn crops, or hauling corn from a combine-harvester, since the stopping and starting and short journeys, apart from the heavy going, will involve a heavier consumption of fuel and oil and also heavier wear and tear than where only road haulage is done. Probably the difficulty could be overcome by "weighting" the mileage figures, for example, each field mile might be reckoned as equal to two road miles.

As regards the tractor, experience has shown that where it is used for general purpose farm work the final results on the

time and on the fuel basis may be very much the same. On the fuel basis, fuel and oil are charged direct to the various crops, etc., as the work is done, while all the other costs are apportioned over the crops, etc., on the basis of the fuel and oil consumption, on the assumption that the harder the work the heavier will be the fuel and oil consumption and therefore the heavier the repairs and depreciation. This means that the tractor driver must keep a careful record of the fuel and oil consumption on the different jobs, whereas for a time basis apportionment the ordinary time sheet suffices. On the whole, preference should be given to the fuel basis and the man who is capable of driving a tractor efficiently should have no difficulty in keeping the necessary fuel and oil record.

In the case of the combine-harvester, the acreage basis at once suggests itself as most suitable for the cost-apportionment, but allowance may have to be made according to whether the crop is threshed directly or first of all windrowed and then threshed.

The above brief sketch of the methods of apportioning the total cost of any machine or group of machines does not profess to be complete. This article is mainly concerned with the accurate determination of the *total costs*, and it is far more important to have the total costs reasonably accurate, even though the *apportionments* may be only rough estimates, than to be able to apportion, with great exactitude, total costs that are of very doubtful accuracy.

A NOTE ON THE GENERAL ECONOMY OF MACHINERY.

Perhaps it may be well to offer one or two concluding observations on the general economy of machinery and thus complete the circle back to page 45. It was there stated that the primary object of using machinery of any kind is to reduce the *unit* costs of production and this is a very different thing from saying that the object is to reduce the *total* costs of production. Maximum profit per unit can be attained either by reducing the total costs with a given total of output value or by increasing the total output value with given total costs. It follows at once that the economy of machinery must not be judged simply and solely on the basis of total costs, but *always* on the basis of total costs *in relation to* total output value. If a machine enables the work to be better done or in better season or with less waste (of time or material) it may prove to be economical, even though it does not cause any reduction in the total costs. Further, since the ultimate objective is *total* profit (after charging interest on capital) and since total profit is the result of profit per unit multiplied by the number of units, it is conceivable that a machine may justify itself

despite a slight decrease in the profit per unit—1,000 units at 1s. per unit profit will be preferred to 900 units at 1s. 1d. per unit.

But all these things apart, reliable conclusions as to the economy of machinery in agricultural production are impossible unless the cost of that machinery can be calculated with reasonable accuracy. It is with the calculation of these costs that this article is mainly concerned and it should be regarded merely as an attempt to write one of the essential chapters in the story of farm mechanisation and its bearing on more economical production.

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APPENDIX.

SCHEDULE OF DEPRECIATION RATES FOR VARYING LENGTHS OF LIFE AND SCRAP VALUES—BY THE DIMINISHING VALUE METHOD.

Percentage : Scrap Value of Original Cost. %	Length of Life. Years.	Depreciation Rate. %
5	5	45.07
	10	25.89
	15	18.09
	20	14.00
10	5	36.90
	10	20.57
	15	14.24
	20	10.87
15	5	31.58
	10	17.29
	15	11.88
	20	9.05
20	5	27.53
	10	14.87
	15	10.18
	20	7.74

Formula. $r = 100 - 100 \sqrt[n]{RV/P}$, where r = rate per cent., n = number of years' life.

RV = scrap value and P = original cost (or book value).

Note. In practice, it would usually be sufficient to take the depreciation rate to the nearest whole number and the actual depreciation to the nearest £1.

Example.—A machine costs £200. It is given a life of 15 years and a scrap value of £20, i.e. 10 per cent., what rate of depreciation should be used? 14 per cent. Hence,

Value after one year = £200 less 14% (£28) = £182.
 " " two years = £182 " 14% (£25) = £157.
 " " three " = £157 " 14% (£22) = £135.
 and so on.

THE IMPORTANCE OF THE PROGENY TEST IN DAIRY CATTLE BREEDING.

INTRODUCTION.

ONE of the earliest pieces of evidence relating to the progeny test and the recognition of its merits by British breeders concerns the "proving" of the great Shorthorn foundation sire Hubback. He was sold as a calf to a blacksmith and later was purchased by a Mr. Fawcett, who lived near Darlington. Charles Colling frequently noticed some excellent veal on the Darlington market and troubled himself to trace the origin of it; Hubback was found to be responsible, was bought by the brothers Colling, and was used by them to the lasting benefit of the breed. Times and standards have changed and no longer do we expect (especially in the breeding of dairy cattle) to find in the vealed calf the characters for which we seek. But the principle remains the same—"by their fruits ye shall know them"—and the progeny test properly applied in the field of dairy cattle breeding has more to offer now than at any time in the past.

Up to the present, although the progressive breeder has been aided by records of the performance of the females in his herd, he has been handicapped by a lack of information on the milk and butterfat transmitting abilities of the male. It is as if a racehorse breeder attempted to breed winners out of dams of known merit by sires of untested worth. A consideration of the part played by the bull in the destinies of the herd emphasises the seriousness of the handicap. Although not himself producing milk, he transmits factors for milk production to each of his offspring in amounts equal to those contributed by the dams to which he is put. In a herd of thirty cows his legacy to the next generation is thirty times as great as that of any individual cow, good or bad, in the herd, and there is obviously much truth in the reflection that the bull now in use may decide what the herd profits will be in five years' time.

Productive ability is not necessarily identical with transmitting ability. If, as will be suggested later, there are dominant and recessive factors concerned in the inheritance of milk and butterfat it is not to be expected that a cow's milk-record will be an infallible indicator of what she will transmit to her offspring, *i.e.*, a cow giving 800 gallons of milk will not in consequence contribute 400 gallons to her progeny. The dominant factors that she possesses (presumably associated with high milk yield) will be expressed in her record, whereas in the sorting-out process prior to reproduction, recessive factors present though unexpressed may be transmitted. The

only reliable valuation of transmitting ability is the progeny test—an assessment based on the records made by the offspring. This is rarely obtainable in the case of the cow because of her short breeding life ; if it be taken as 4 years it is clear that she can, on the average, produce only two female offspring by which to be judged—a very inadequate number, as we shall see. The bull's progeny, however, are more numerous, and it is to them that the breeder must look for an index of the nature of the bull's inheritance.

In the proving of a dairy bull the lactations of his daughters constitute the foundation, and as any influence affecting these lactations affects also the progeny test, a system of treating them that takes cognizance of environmental and hereditary influences has to be evolved before comparisons among performances of different sires can be rationally made. The following questions, amongst others, have to be considered ; what is to be defined as a lactation : can records made under different systems of feeding and management be compared : can a lactation made in the heifer year be compared with one made at a later stage : can a bull proved by records made by twice a day milking be compared with one whose daughters are milked three times a day ? In addition we have to decide upon the number of daughters necessary to give a reliable indication of their sire's milk transmitting ability, and also upon the possible effect of the level of their dams' production. Are six daughters sufficient, and has a bull put to cows averaging 9,000 pounds of milk a better chance than one in a herd with a 7,000-pound average ? Also of moment at the present time is the question of the utility of the sire index, a formula designed to eliminate some of these influences so that a true estimate of the bull may be made.

It is intended, first of all, to elucidate some of these points before enlarging on the more practical and economic aspects of the proved sire and his place in scientific dairy cattle breeding.

FACTORS INFLUENCING A MILK RECORD.

It is almost true to say that health, feeding and heredity make a milk record because they undoubtedly constitute the three factors most important in its production. That the level of feeding in a herd is of the greatest importance in proving bulls may be illustrated by the following example :

Bull A.		I.		II.	
	Item.		Lb. milk.		Lb. milk.
Daughters' Av. Production	.	(Official)	18,117	(Official)	18,117
Dams' Av. Production	.	(Official)	18,549	(Normal)	12,478
Difference	.		<u>-1,432</u>		<u>+5,639</u>

Bull A was in use in a herd in the United States where two systems of feeding were practised, one, on a high plane, for official records, the other on a more normal plane. A cow might be put on official test for one lactation, thereafter entering the general herd. As is seen in Column I, Bull A's daughters made an average of 18,117 pounds of milk on official test compared with the 19,549-pound average production of their dams. These dams also had "normal" records which averaged 12,478 pounds (Column II). When the yields of his daughters are compared with these latter records, Bull A appears to much better advantage, seemingly having to his credit an increase of 5,639 pounds of milk. Although in this country it is not usual to have two distinct systems of feeding in one herd, the example illustrates the problem involved in comparing a bull in a herd where feeding is akin to "normal" with one in a herd where "official" conditions obtain.

From the breeding standpoint the most important fact about feeding is that, if it is inadequate, the limits of an animal's inheritance for production are not discoverable. The view is generally held that if the feeding policy restricts a herd to a 600-gallon average the cows that are capable of higher yields will be indistinguishable from those that have reached their limit at 600 gallons. But the higher levels are not always economic, unless the records made possess advertising value; and so it appears that the bull's assessment cannot go beyond the limit imposed by feeding.

Under practical herd conditions it does not seem possible that any adjustment can be made to compensate one bull, in comparing him with another, for the fact that his daughters have not been so well treated. There is no proof that, given better treatment, they could have responded to it, while credit is due to the others for having done so. Of course the better the feeding the more critical is the test.

A similar conclusion must be reached with regard to the frequency of daily milking. Conversion factors, based on the increases in yield that extra milkings bring about, have been suggested (Ref. 21) for the purpose of compensating a twice-daily record so that it may be compared with a thrice-daily record. But it is believed that high yielders make a proportionately greater response to thrice milking than do low yielders and therefore the use of a general conversion factor cannot be justified.

The theory that the age of the parents at the time of birth of the calf might influence its performance has been disproved in so far as it concerns milk yield (Ref. 6).

The influence of age on milk yield has been studied in this country by Sanders (Ref. 16) and Kay and M'Candlish (Ref.

11). These investigators find that a cow's maximum production or "mature yield" (as it will hereafter be called) is reached at the fifth lactation. Sanders has also examined the influence of the rest period (the number of days for which a cow is dry preceding her next lactation) and of the service period (the number of days elapsing between calving and the next fertile service). The longer the rest period the higher will be the yield following it, especially in the case of heifers that have concluded their first lactation. It is generally appreciated that if the breeding of an animal is delayed the rate of milk secretion remains at a high level for a longer period than in a lactation in which early pregnancy occurs. The practice of allowing very long service periods is not economical and is likely to be followed intentionally only where a high record is desired for advertisement or for other special reason.

For the influences of age, rest period and service period conversion factors are available; the extent to which they may be used for the purpose of standardising lactations, so that they may be made comparable, has to be decided upon. For the purpose of progeny-recording in proving bulls the treatment of the records must be simple and accurate. Suppose we adopt as a simple system (A) the definition of a lactation yield as the amount of milk given in the first 315 days after calving (excluding 4 days suckling) and decide to convert it to a mature basis by the use of the general age correction factors whereby 30 per cent. is added to a first lactation yield, 20 per cent. to a second and 10 per cent. to a third. As an alternative (B) we have the total milk given in a complete lactation period, which quantity may be converted to "maturity" by the use of the exact correction factors that have been evolved for age, service period and dry period. The following are the progeny tests of three bulls used in one herd interpreted by both systems:

Item.				System A. Lb. milk.	System B. Lb. milk.
SIRE I.	Daughters' Av. Yield (11)	.	.	9,817	9,546
	Dams' Av. Yield (11)	.	.	10,151	9,722
	Difference	.	.	—334	—176
SIRE II.	Daughters' Av. Yield (10)	.	.	10,670	9,917
	Dams' Av. Yield (10)	.	.	10,076	9,985
	Difference	.	.	+594	—68
SIRE III.	Daughters' Av. Yield (26)	.	.	10,991	10,996
	Dams' Av. Yield (26)	.	.	9,000	9,016
	Difference	.	.	+1,991	+1,980

The estimates are seen to be very similar. This fact is not in itself a criterion of accuracy but to these data a statistical test (involving an analysis of variance amongst corrected yields) has been applied which shows that system A is as exact as system B.

While the 315-day lactation yield, converted to a mature basis, is a satisfactory figure for proving and comparing the merits of bulls under practical conditions, reference must be made to a standardised plan of testing employed by several American Institutions in connection with their breeding work. By the following process the plan aims at controlling as many as possible of the factors influencing milk-yield; heifers are bred to calve at a fixed age; all cows are subjected to an official test in their heifer year and at maturity; the duration of the test is the same for all animals and all are served 4 months after the beginning of it; cows are milked thrice daily until falling to a defined limit of production and thereafter twice daily; a standard grain ration, unchanged in composition from year to year, is fed unless it becomes impossible to provide it. This standardisation of feeding and management allows differences in actual milk heredities to reveal themselves. For college herds and the larger breeding farms some similar scheme is very desirable though it is doubtful if more general application is possible. Meanwhile it is obvious that for studies of breeding undertaken at present the fullest knowledge of the conditions under which records are made is essential.

INHERITANCE OF MILK YIELD AND BUTTERFAT.

It is difficult to estimate the value of the contributions which the relatively new science of genetics has to make to dairy cattle breeding. Notably with plants, but also in the case of many of the smaller animals, it has been of service in elucidating problems of heredity and in providing a rational basis for the evolution of new strains possessing characters desired. But these characters have in many cases been dependent either on single, or at most on a few, factors, a condition very different from that obtaining in the inheritance of milk-yield. Here a great number of factors are involved. The cow must have a strong constitution, an adequate secretory network in her udder, a capacity to convert food into milk and butterfat, and must be free from breeding troubles if she is to produce a satisfactory record. For the purpose of assessing the bull's inheritance for some of these qualities by a study of his daughters' records a knowledge of the manner in which they are inherited would be most useful. Assuming that multiple factors for milking ability are involved the discussion

centres around the mode of their expression; is there dominance of some factors and recessiveness of others? Or is it a case of blending inheritance—i.e., if the dam has a yield of 800 gallons and the sire (by progeny test) of 1,000 gallons, will the offspring produce 900 gallons? It is also desirable to know whether milk and butterfat are inherited together or separately, and whether they can be combined in high amounts in one animal.

It would appear that a cross-breeding experiment between a high yielding breed and a low yielding breed (e.g., a beef breed) should solve these problems. But there are certain limitations inherent to this method of which we should be aware when considering results already obtained by its use. If the female for the experiment be a dairy animal her milk record may be used as an estimate of her inheritance. But what is to be done in the case of a beef bull employed in crossing with her? An estimate of his inheritance is required if the yield of the progeny is to be compared with their parents' performances. The use of a breed average figure, or the average production of a group of near relatives where there is no progeny test on the bull, is open to the criticism that the latter animal may transmit milk-yield and butterfat in a very different and characteristic manner. Then, too, the time required for a complete experiment is very great. Two generations of offspring and back-crosses to the parent breeds are required if the nature of the inheritance is to be revealed. A further handicap is the economic limitation to the number of crosses which may be kept. Gowen (Ref. 8) as a result of a cross-breeding experiment concluded that high milk yield is partially dominant to low milk yield and that high butterfat is partially recessive to low butterfat. Gaines (Ref. 4) and Wriedt (Ref. 22) have analysed results of similar experiments, but it is true to say that no conclusive facts have so far been arrived at by this method.

Another mode of attack on the problem lies in the statistical treatment of milk records—by correlating the yields of offspring with the yields of their ancestors in order to discover the relative importance of the contributions made by each. Much work along this line has been done by Gowen (Ref. 9) and Turner (Ref. 19). A partial correlation calculation has to be employed, as a direct correlation ignores the part played by one of the parents. Turner concluded that many of the factors influencing high production are dominants. The alternative hypothesis of blending inheritance is untenable because, according to that view, a cow's yield would be an exact measure of her genetic constitution for milk production and her contribution to her progeny would be one-half of this

production. That this is not so is shown by the low correlation between the record of a dam and the record of her daughter, found by Turner to be 0.15. The milk record of a cow is a phenotypic expression. Dominant factors will be expressed, but either dominant or recessive factors will be transmitted.

Most investigators are agreed (Refs. 4, 9 and 20) that milk and butterfat are inherited independently in the sense that their secretions are influenced by different factors. Some find (Refs. 15 and 18) that there is a negative correlation between the two—the one increasing as the other decreases. Gaines believes that the limiting factor affecting both is the energy involved in the production of the milk constituents, so that there appears to be little immediate chance of securing the highest milk yield combined with the highest butterfat content by the crossing of two breeds each noted for excellence in the one or the other sphere. While the negative correlation theory may hold for extreme performances, records made under more normal conditions show that an individual sire may effect an increase or a decrease of both milk yield and fat content, or may increase one and decrease the other.

Our present knowledge of the genetics of milk and butterfat is neither certain nor complete. We benefit from the conception of a multiple factor inheritance and from the knowledge that production is not necessarily the same thing as transmitting ability. A progeny test is essential for the assessment of this latter quality and because of this the case for the proved dairy sire is greatly strengthened.

METHODS EMPLOYED IN SELECTING A HERD SIRE.

It may seem superfluous to stress the fact that the greatest care must be taken in the selection of the herd sire. The point about his major contribution to the next generation of milk producers has already been made. Important as this is for the individual dairy farmer, it becomes of even greater moment where bulls are subsidised for community use, because here the scope for effecting improvement or the reverse is increased. Also, whereas a cow may be bought on her record, tested on entry to the herd and discarded if unsatisfactory, such safeguards are entirely lacking in the purchasing of a sire. He remains for two or three years an unknown quantity, his owner being unable to diagnose, except from the doubtful indications provided by his young stock, whether or not the future milk yield of the herd is secure.

A critical examination of the methods which are at the disposal of the breeder in search of a herd sire is desirable. He may base his choice on one or more of three criteria, type,

pedigree and the progeny test. The first of these may in itself possess economic value, but it is important to realise that as an indicator of milk inheritance it possesses little value. Exhaustive studies (Ref. 9) of correlations between type points and milk yield have shown that these exist, in the female, only in respect of the more obvious characters such as size and quality of the udder and the development of the milk-veins. There is no known correlation between the type points of a bull and the milk yields of his daughters. Hence the choice of a bull on the ground that he "looks milky" cannot be justified on a scientific basis. Prentice (Ref. 14) makes the point that if type be correlated with high production, concentration on the latter object will incidentally achieve the former.

Selection based on pedigree may mean one of two things. If a bull is chosen because names in his pedigree are fashionable or traditional without attention being paid to the actual milk transmitting performance of animals close up in his pedigree, his success cannot be vouched for. If, on the other hand, a good pedigree is taken to mean a near ancestry possessing full and high milk records, it becomes a scientific criterion and one likely to lead to success. By records of a "near ancestry" are meant (in order of importance) a progeny test on the sire, the dam's record, the records of her sisters and half-sisters, and similar records of the grandparents. The forecasting value of records further back in the pedigree is slight. But rarely is such full knowledge available. Even where there are records for the three nearest females in the pedigree, an accurate indication of the performances of the three nearest males is usually absent. They may have been progeny-tested in the sense that they have sired recorded daughters, but the results cannot be easily traced.

The surest method of all is selection based on the progeny test. This method is not new; it was used by breeders in the founding of our British breeds. Bulls were hired out on neighbouring farms and were only taken back if they proved, by the progeny test, to be satisfactory. More recently, in America, Graves (Ref. 10) has planned an experiment in constructive dairy cattle breeding in which only proved sires are being used. Offspring representing the fifth generation of matings of proved bulls on daughters by proved bulls are now in milk. A steady increase in milk production is being achieved, and the most remarkable and satisfactory fact is that the individual yields are uniformly high. Poor producers have been almost entirely eliminated and sons of the proved bulls, when tried out on herds before being brought into the experiment, show themselves to be transmitting the high production which their sisters reveal by their performances. The conducting of such

an experiment in this country, as a co-operative venture amongst College and Institute farms and in the larger pedigree herds, would be a most effective method of testing and proving bulls and would, incidentally, help in the construction of strains of high-yielding dairy cattle from which reliable breeding stock might be distributed to dairy farmers.

THE PROGENY TEST.

For the progeny test it was decided (p. 71) to use when analysing daughters' yields the 315-day lactation yield converted to a mature basis ; there still remains the question of how many daughters are necessary. It is logical to assume that the greater the number the more accurate will the test be ; but since the desirability or otherwise of using the sire further will depend on it we are concerned rather with the minimum number required. The statistical method employed in arriving at this figure is discussed elsewhere (Ref. 2). The results are here summarised in Table I and in the explanation following.

TABLE I.

Showing how the accuracy of the progeny test increases with the number of daughters.

No. of daughters.	Standard deviation. Lb. milk.	Significant difference. Lb. milk.
1	1,840.5	5,521.5
2	1,301.6	3,904.8
3	1,062.6	3,187.8
4	920.3	2,760.9
5	823.1	2,469.3
6	751.3	2,253.5
7	695.6	2,086.4
8	650.8	1,952.4
9	613.5	1,840.5
10	582.1	1,746.3
11	554.9	1,664.7
12	531.3	1,593.9
13	510.4	1,531.2
14	491.8	1,475.2
15	475.2	1,425.6

For our purpose the figures to be found in the "Significant Difference" column are most important. They indicate the difference which must exist between the yields of a given number of daughters of the bulls being compared before one bull can be said to be significantly better than another. For example, in

the case of two bulls with one daughter each, the difference between the yields of the daughters would have to be at least 5,521.5 lb. of milk before it could be said that one sire was significantly better than the other. With three daughters the margin required would be 3,187.8 lb. and with six, 2,253.5 lb. Even with this test to go by the choice of the minimum number of daughters remains an arbitrary matter. It is obvious that the accuracy of prediction (*i.e.*, the decrease in the margin required) increases most rapidly with the first few daughters. From one to two daughters the margin decreases by 1,616.7 lb., whereas a seventh daughter where there are already six causes a reduction of only 167.1 lb. Clearly there can be no hard and fast rule, but it is suggested that any number less than six is insufficient for a reliable progeny test. The Significant Difference figure below this limit is too large for the estimate to mean much. Of course each daughter's record added to the minimum number increases the accuracy though at a decreasing rate.

There is an important corollary to this discussion of the number of daughters required. It is that the daughters for the test shall be unselected. All progeny must be considered in assessing the bull. Schemes designed to draw attention to outstanding sires which do not do this must necessarily be incomplete. The fixing of a level of production which an arbitrary number of daughters must reach before their sire can claim recognition is open to the criticism that the equally valuable information about poor producers which the bull may also have sired is lacking. Opportunity (size of herd, for example) may under these conditions be as much the cause of a sire's recognition as real merit. We have records of two sires of the same breed, A with a total of 38 daughters, B with 10 daughters. Fixing an entrance requirement of 10,000 lb. milk (mature) as our standard, we find that Sire A has 10 daughters above this and Sire B, six. Were this latter piece of knowledge alone available we should be inclined to rate A the better sire, but with the fuller particulars it appears that only 26 per cent. of his daughters, as against 60 per cent. of B's, were able to meet the requirements.

ANALYSIS OF PROGENY TESTS OF FIFTY-ONE SIRES.

All the information required for the recording and proving of the dairy sires in use in milk-recording herds is to be found in the annual herd registers of the Milk Recording Society. The amount of milk given in the first 315 days of the lactation can be easily computed and the sire and dam of each cow are usually stated. The fact that all cows in the herd must be

recorded ensures the fulfilment of the condition that progeny be unselected. These herd registers were the source of the data on which the 51 sires listed in Table II were proved. In a way the study is partly retrospective because a few of the bulls have been dead for some years. In each case as many lactations as possible were taken for both dam and daughter.

The sires are grouped by breed and by herd. (This latter arrangement aids the comparison of sires whose daughters have produced milk under reasonably similar conditions.) The table contains records of bulls of the following breeds: Dairy Shorthorn, 23; Lincoln Red Shorthorn, 5; British Friesian, 16; Ayrshire, 3; Red Poll, 2; and Jersey, 2.

A study of individual performances reveals some striking differences in the transmission of milking ability. Sires 1 and 2, for example: the former put to dams averaging 7,700 lb. milk sired 11 daughters averaging 8,700 lb. milk; the latter from dams averaging 8,400 lb. milk sired 8 daughters averaging 4,050 lb. milk. Sire 20 has 11 daughters with a mature average production of 4,861 lb. milk out of dams yielding 7,690 lb., while the 8 progeny of sire 28 gave 10,560 lb. compared with their dams' 8,560 lb. production.

For several reasons too much emphasis should not be placed on the daughter-dam differences. For one thing, the influences of environment are such that a difference amounting to at least 1,000 lb. must exist before it can be considered significant. (With this rough measure of the achievements of the 51 sires, 8 caused real increases, 20 real decreases, and the results of the remaining 23 were indecisive.) For another, the figures are averages of several yields, whereas the nature of the yields comprising the average is of more importance (see below). There is the tendency, which cannot be estimated, for regression to the breed average. And since, as previously explained, the dam's contribution to her daughter is difficult to assess, caution must be exercised in implicating her in any definite way. *The daughters' records themselves are of pre-eminent importance and, as they provide a genetic picture of their sire's milk inheritance, they have a claim to chief consideration.*

ECONOMIC AND PRACTICAL CONSIDERATIONS.

Two factors influencing the profits from a herd are (a) its position with regard to replacements and (b) the average yield that can be maintained. It is clear that the proved sire is closely linked with both. If an economic yield can be kept up by home-bred heifers entering the herd, with perhaps the sale of surplus stock, the position is secure; but if poor producers are bred the position is very different. The yield suffers and a

TABLE II.
PROGENY TEST OF 51 SIRES.

Herd and Breed.	No. of Bull.	Mature Av. yield of daughters. Lb. milk.	Mature Av. yield of dams. Lb. milk.	Difference in yield. Lb. milk.	No. of Daughter- dam. pairs.
A Shorthorn . .	1	8,700	7,700	+1,000	11
	2	4,050	8,400	-4,350	8
	3	5,300	8,800	-3,500	12
	4	7,000	9,300	-2,300	18
B „ . .	5	7,790	9,550	-1,800	10
	6	10,200	9,500	+ 700	5
	7	7,100	7,900	- 800	5
C „ . .	8	9,839	7,225	+2,614	10
	9	6,503	7,222	- 719	28
	10	6,439	7,843	-1,414	15
D „ . .	11	8,662	7,382	+1,280	28
	12	8,513	7,363	+1,550	15
	13	7,460	7,509	- 49	14
	14	7,305	7,334	- 29	11
	15	6,578	7,814	-1,236	13
	16	7,905	8,339	- 434	40
E „ . .	17	11,392	7,819	+3,573	7
	18	8,762	8,791	- 29	6
F „ . .	19	5,266	6,759	-1,493	13
	20	4,861	7,690	-2,829	11
G „ . .	21	8,532	6,914	+1,618	8
	22	8,242	9,348	-1,106	7
H „ . .	23	7,830	9,070	-1,240	10
I Lincoln Red Shorthorn . .	24	8,100	7,130	+ 970	6
	25	8,300	7,800	+ 500	5
	26	6,900	6,530	+ 500	10
J „ . .	27	8,890	9,850	- 960	13
	28	10,560	8,560	+2,000	8
K Br. Friesian . .	29	9,223	10,453	-1,230	38
	30	9,607	9,764	- 157	17
	31	9,071	8,424	+ 647	7
	32	9,018	10,135	-1,117	12
	33	8,164	8,709	- 545	8
L „ . .	34	9,871	10,151	- 280	11
	35	10,670	10,076	+ 596	10
	36	10,991	9,000	+1,991	26
M „ . .	37	9,448	10,447	- 999	18
	38	10,327	11,746	-1,419	58
	39	10,266	12,682	-2,416	10
	40	10,659	11,865	-1,206	9
N „ . .	41	7,983	8,738	- 755	7
	42	8,799	8,924	- 125	60
O „ . .	43	8,530	9,630	-1,100	13
	44	8,000	10,400	-2,400	4
P Ayrshire . .	45	9,100	8,500	+ 600	7
	46	7,810	7,440	+ 370	9
	47	8,850	8,040	+ 810	9
Q Red Poll . .	48	5,020	6,160	-1,140	6
R „ . .	49	9,202	7,967	+1,235	13
S Jersey . .	50	8,162	8,526	- 364	7
	51	6,424	8,455	-2,031	6

loss is incurred in the sale of culls (probably as beef) in place of which dairy animals have to be purchased. There is also the risk of introducing disease. It is not difficult to appreciate that the progeny of a single sire may so alter the complex of the herd as to make for one or other of these conditions. A detailed account of the progeny records of sires Nos. 8 and 20 is given here so that they may be judged by the two criteria of herd replacements and herd average yield.

No. of Daughter.	HERD C.	HERD F.
	Yields of Daughters of Sire 8. Lb. milk.	Yields of Daughters of Sire 20. Lb. milk.
1	7,318	1,601
2	7,757	2,021
3	7,917	3,039
4	8,551	3,476
5	9,287	3,900
6	10,713	5,067
7	11,002	6,024
8	12,969	6,056
9	13,039	6,561
10	—	7,175
11	—	8,559
Av. of Daughters	9,839	4,861

The average of the dams was about the same in both cases—7,225 lb. of milk in herd C and 7,690 lb. in herd F. In the former case it is obvious that there was little difficulty in providing replacements from home-bred heifers so long as sire 8 was in use. All his daughters possessed yields at least above the average of their dams, the actual average increase being 2,614 lb. of milk. With the price of milk at 1s. per gallon, this represents (roughly) an increased gross return of £13 per daughter per year, or £117 for the nine of them. In herd F the position was very different. The yields of at least 6, and probably 9, daughters were uneconomic (for these are mature yields and the heifer lactations would be about 30 per cent. less), and it is clear that not only did the average yield suffer so long as they were in the herd, but also that any policy of providing home-bred heifers for the herd was doomed to failure as a result of sire 20's use. The latter is no doubt an extreme example, but in all dairy herds with reasonably high milk yields some downward pull is a frequent cause of the dual loss just described.

The importance of being aware of the nature of the individual records comprising the "daughters' average" figure may be seen by comparing the progeny tests of sires 32 and 47. Both have daughters averaging about 9,000 lb. milk, but the averages are made up in different ways:

No. of Daughter.	Yields of Daughters of Sire 32. Lb. milk.	Yields of Daughters of Sire 47. Lb. milk.
1	4,789	8,000
2	5,859	8,390
3	5,996	8,500
4	6,880	8,550
5	8,320	8,700
6	8,723	8,700
7	9,104	9,350
8	10,388	9,700
9	11,244	9,820
10	11,780	—
11	12,213	—
Av. Yield	9,018	8,850

The yields of the daughters of sire 32 range from 4,789 lb. to 12,213 lb., whereas those of sire 47 show little variation. The latter state of affairs is the more desirable since if for a given set of conditions the average yield is the economic one, extreme yields on either side of it will detract from profits. The need is for bulls that will consistently sire a high proportion of good yielding daughters. Gowen says "the problem of breeding better dairy stock is not so much to produce animals of higher production than those which we have to-day as it is to be able to produce the best of our present-day stock uniformly and at will." That the problem still exists is shown by the records of some of these bulls and by recent surveys of wastage in dairy herds (Ref. 17) which reveal the fact that 20 per cent. of the cows removed from herds annually are disposed of because of low milk production. That the solution of the problem is closely connected with the proved bull can be understood from the performances of some of the better sires. The sire proved to be transmitting factors for relatively high milk yield is the one whose breeding life must be prolonged. This will be to the advantage both of the owners in whose herds he is used and to the breed which he represents.

It is necessary, therefore, to consider (1) methods by which an extension of the breeding lives of good bulls may be obtained and (2) means that may be employed in order that in the selection of a young untested bull the chances may be increased of choosing one which will in time be proved good. Buchanan-Smith (Ref. 1) has calculated that 80 per cent. of dairy bulls are killed before their daughters come into milk. This would indeed be tragic were it not also true that as a result of present-day methods of selection at least half of the number is as well dead. We cannot advocate the keeping alive of all bulls until their daughters come into milk. Such a practice (even if facilities were available for it) would involve

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a loss on those bulls that would have to be got rid of after the test. But the present indiscriminate killing of the good with the bad results in a great loss to the dairy industry. The problem in the first place centres round the choice of the young untested sire. If he can be chosen in such a way as to improve the odds in favour of his becoming a proved sire, avenues for prolonging his breeding life can more logically be explored. From what has been said it is obvious that, as a basis of selection, the records of females in the pedigree are not enough. The dams of sires 1, 2 and 3 had the following records :

No. of Sire.	Yield of Dam. Lb. milk.	Yield of Progeny. Lb. milk.
1	8,000	8,700
2	8,578	4,050
3	9,363	5,300

Clearly in these cases the dams' records gave no indication of the milk yield which their sons were to transmit. A fuller pedigree, with records of sisters, half-sisters and grand-dams would have been more reliable; but so long as the male side of the pedigree remains blank it cannot be considered complete. A progeny test for the sire of the young untested bull under consideration should be available for examination. The purchase of an untested bull which is the son of another untested bull is twice removed from certainty. The point we wish to make is that the son of a proved bull and a recorded cow is the next best thing to a proved bull. If his sire is proved it means that he has transmitted a satisfactory milk yield to his daughters and hence also, in all probability, to his sons. (It will be remembered that in discussing the American Government experiments conducted by Graves (Ref. 10) the fact was noted that the sons of proved bulls acquitted themselves well.) A good illustration of the way in which a progeny test on the sire of a young bull may aid in the latter's selection is provided by the two pedigrees shown on the opposite page.

The dairy farmer in search of a bull that he hopes will keep up his herd average will hesitate before choosing sire A. The brother of such a poor lot of sisters is likely to have inherited the family failing of low milk yield. Bull X, on the other hand, is an attractive proposition. Clearly the progeny test in the pedigree is providing the very evidence required—evidence which will reduce the element of chance in the selection of dairy bulls.

Some system is necessary so that progeny tests on bulls in use in dairy herds may become regularly available. The ideal unit for procuring these records is the Milk Recording Society, because at least once a year all the herd registers of its members

Milk Pedigree of Young Bull A.

		SIRE B.		Yields of B.'s Daughters.	
A	1	.	.	.	4,200
	2	.	.	.	2,700
	3	.	.	.	3,700
	4	.	.	.	5,200
	5	.	.	.	7,100
	6	.	.	.	7,300
	7	.	.	.	4,200
	8	.	.	.	5,900
	9	.	.	.	3,700
	10	.	.	.	7,700
	11	.	.	.	6,400
	12	.	.	.	5,600
Av.					5,310
DAM C.					
Milk yield					9,363 lb.

Milk Pedigree of Young Bull X.

		SIRE Y.		Yields of Y.'s Daughters.	
X	1	.	.	.	5,100
	2	.	.	.	6,500
	3	.	.	.	7,600
	4	.	.	.	7,800
	5	.	.	.	8,000
	6	.	.	.	8,200
	7	.	.	.	8,600
	8	.	.	.	8,600
	9	.	.	.	10,100
	10	.	.	.	12,400
	11	.	.	.	13,100
Av.					8,700
DAM Z.					
Milk yield					8,700 lb.

are returned to it. A scheme suggesting the manner in which these registers may be utilised has been suggested by one of the writers (Ref. 3), the essence of it being as follows :

- (1) A progeny record sheet is inserted at the back of the annual herd register. On it records of all daughters to the herd bull or bulls are listed, the amount of milk given in the first 315 days of their lactations being stated. The records may be entered by the recorder, or entered by the farmer and checked by the recorder.
- (2) When the herd register is received annually by the Secretary of the Milk Recording Society this progeny record sheet is detached. The records of the daughters, converted to a mature basis, are filed on the appropriate bull-card, which forms a permanent record of the progeny of that sire.
- (3) As soon as six progeny of a sire have been recorded, a duplicate of his card might be given the owner, to be used by him in the selling of young stock, male or female.

The milk records for regular progeny-recording are in existence, ready for use, but so long as they are made to serve only as rationing or culling standards a great waste of material ideally suited for scientific advancement in breeding must continue. For enhancing the worth of a pedigree the progeny record is invaluable and although it is doubtful if the Breed

Societies could bear the expense of abstracting all the records of their bulls in use, it seems to us that their co-operation with the Milk Recording Societies and the Agricultural Education Authorities might achieve much.

Given young sires possessing milk pedigrees suggestive of a good inheritance, there remains the problem of how to keep them alive until their daughters come into milk. The dairy farmer with a small herd cannot keep a bull for more than about 2½ years. By the end of this period the first lot of the bull's own daughters will have to be served and close inbreeding to a bull not yet proved cannot be advocated universally. The cost of keeping two bulls would be an unnecessary burden on the herd. But there are many farmers in this position of having to buy another bull. For them it is suggested that a policy of exchanging bulls or buying promising "old" bulls is sound. About one year later the daughters of exchanged bulls will be in milk, giving an indication of their sires' worth. Should they be proved high milk transmitters their own value, together with that of their male and female stock, becomes great, to say nothing of the security of the milk output.

At the present time one of the commonest factors militating against the use of an old bull is his temper; the trouble and danger connected with the handling of an animal of uncertain or evil disposition is considered to be too great and so a young bull is bought. There is also the fear that age will have brought with it decreased fertility or slowness at service and that increased weight will be too much for the young heifers. To remain temperamentally and physically healthy the bull must be treated to conditions normally conducive to such a state. These are not likely to obtain where the bull is closely confined, perhaps in semi-darkness, having neither exercise nor company. Yet this is undoubtedly the lot of many bulls in use to-day. Temper and weight can be controlled to an important extent by adopting suitable systems of feeding and management. At the farms of the United States Department of Agriculture at Beltsville the proved bulls in use are exercised for three hours each day by being harnessed to a large revolving wheel kept rotating by one of them. This method, together with that of walking the bull daily for exercise, is obviously not within the scope of the commercial dairy farmer. But the provision of a small fenced paddock, with a shelter, in which the bull may exercise and be in the open air, meets all requirements. Company may be provided by the introduction of a dry cow. Another method, that of tethering the bull to a cable, the length of which he may traverse, has been shown to be serviceable. Suitable feeding, for fitness rather than fatness, together with gentle handling by the

herdsman in charge, will also help to keep a bull fit and to prolong his breeding life.

Some will think that means for the saving of proved or potentially proved bulls should be more definite than those urging an exchange of old bulls and improvements in their management. In this connection the following statement by Lush (Ref. 12) may be quoted: "The physical and biological requirements involved in proving sires are such that no breeder can accomplish much by himself unless he has a herd large enough to justify keeping a half-dozen or more sires in service at all times. There are few such herds. To accomplish much, most breeders must have in one way or another the co-operation of other dairymen." Schemes designed for the purpose of proving bulls are already in existence in such dairying countries as Holland, Denmark and the United States. In the latter country there are 359 Co-operative Bull Associations, together with many organisations concerned with progeny recording. In a co-operative bull association an area is divided into some four, five or six blocks with about 60 dairy cattle in each. The members of the combined unit purchase the sires, one for each block. (A block may comprise, for example, 6 herds of 10 cows each or 1 herd of 60 cows.) Every two years each sire is moved to another block, and in this way is kept alive and in use until he is proved. These associations have accomplished improvements of a fundamental nature in live stock standards. Of course the owners of the larger pedigree herds may still have recourse to the methods employed by such historic breed improvers as the Colling brothers and Bakewell, whereby young bulls may be loaned or hired out to neighbouring herds where they can be tested. We think the system could be extended with advantage to-day by the leasing of bulls to approved farmers free, or for a small premium. There would also seem to be possibilities in the rearing of dairy bull calves bred from progeny-tested pedigree sires and out of high-yielding cows. To test this suggestion one of the writers (J.H.S.) is anxious to obtain a limited number of such calves to be reared at Oaklands and sold ready for use about a year later.

In conclusion, attention is again drawn to Table II on page 79 which contains a summary of the milk transmitting qualities of 51 bulls used in milk-recorded herds. Several of these bulls have been sources of serious loss to their owners; others have scarcely fulfilled expectations and only a few have left progeny superior to their dams. It is hoped that the publication of these results and the discussion of the subject in this paper will lead to a more systematic utilisation of the information which is accumulating year after year in the books of Milk Recording Societies and that nothing will be allowed to

prevent a rapid extension of the only sure way of reducing the speculation, apparently always heavily weighted against the farmer, in breeding for milk.

SUMMARY AND RECOMMENDATION.

The more important practical considerations in milk inheritance are reviewed in the light of recent investigations of the subject at home and abroad. Emphasis is laid on the value of the progeny test, and on the need for more scientific use of the data now being accumulated in the records of the Milk Recording Societies. Examples are given to illustrate the speculative nature of the results following upon the use of young untried dairy sires. Such results are compared with the relative certainty of success from the use of sires whose milk inheritances are proven through the milk yields of their daughters.

The weakness of the one-sided milk pedigree is discussed. In such a case reliance is placed on the production of the females composing it, but this production is not necessarily a guide to the milking capacity that they will transmit to their offspring. The chief weakness lies in the fact that such a pedigree takes no account of the milk transmitting qualities of the males in it. Disastrous results frequently follow the use of a young bull out of a good dam but sired by a bull which is entirely an unknown quantity from the point of view of milk inheritance. This blank in the pedigree can only be filled by obtaining information regarding performances on the male side of the pedigree, *i.e.*, milk records of daughters of the sires.

The view is expressed that very special care is required in the selection of the dairy herd sire, not only because his value cannot be immediately measured, but also because his legacy to the next generation of milk-producers is so much greater than that of any individual cow. It is pointed out that there is no known correlation between the type points of the bull and his inheritance for milk yield, and attention is directed to more scientific criteria.

Methods of recording bulls by records of their progeny are examined, and a simplified procedure, found to be workable under practical conditions, is recommended. A more extended use of this simple method will lead to the discovery of an increasing number of bulls which should on account of their proved value be kept alive and in active service.

Certain practical measures to secure the greatest benefits from old proven bulls are discussed. For example, it is considered necessary to obtain a standard higher than that frequently found in practice in the care and management of

dairy sires if they are to be healthy, active and tractable in their later years. It is suggested that a solution to the problem arising in the majority of medium-sized herds, when the daughters of a promising bull reach maturity, is possible either by the adoption of a system of co-operative bull ownership (which has proved successful in other countries), or the exchange of bulls with neighbours, or the purchase of old bulls. By these methods the transmitting abilities of two or more bulls can soon be definitely assessed.

Obviously the foregoing measures cover only part of the field. There are not proved bulls for all and, before being proved, young untested bulls have to be used. In the selection of the latter it is suggested that first emphasis be placed on the progeny records of their sires. If a young bull is by a sire whose daughters are performing well, he will most probably have inherited the milking capacity which his sisters are expressing. By experiment it has been shown that the son from a proved bull is "the next best thing" to a proved bull, and though a satisfactory performance is not so certain in this case, the risk of disappointment is much less than in the case of an untested bull chosen without reference to his sire.

Regular progeny recording is the rational foundation for the breeding of dairy cattle. Through it pedigree systems replete with information on the performance of male and female ancestors can be built up; high yielding and low yielding strains will be revealed, and from the former may be selected young bulls that can reasonably be expected to become the proven sires of the future.

Finally, it is true to say that the present high standard of British cattle is due in no small measure to the application, by the pioneers, of the principle of the progeny-tested sire. This principle remains the corner-stone of dairy cattle breeding, and breeders of to-day who wish to see the supremacy of British live stock maintained cannot afford to reject it.

In an appendix a review of certain Sire Index Systems is made.

APPENDIX.

SIRE INDICES.

A study of the proved sire would not be complete without a short reference to the Sire Index Systems. In its simplest form the progeny test is concerned with the yields of daughters to a certain sire. For several reasons this evidence has been considered inadequate and it is with a view to supplementing it or increasing its accuracy that the various sire indices have been formulated. The level of production of the cows to which

a bull is put is considered by some to be of great importance in determining the production of the daughters and the sire index aims at separating out this influence so that the part played by the bull may be found. The need has been felt for some formula which will arrange in an order of merit bulls that have brought about increases on low producing dams, decreases or increases on high producing dams. If, too, there is partial dominance of high milk yield, an allowance for it ought to be made. And as the accuracy of the progeny test increases with the number of daughters' records available, some recognition of this fact has been considered desirable. A brief account of three indices will now be given, together with the results of their application to a given set of data.

INDEX 1.

Sire's index = Twice the Daughters' average production *minus* the dams' average production.

This index was suggested and used by Yapp (Ref. 24). The formula credits the sire with the total increase or decrease in yield calculated from the dams' average, that is, the progeny yields are assumed to be exact blends of the milk heredities of sire and dam. The index was stated by Yapp as a percentage of the average production of a large cow population, he being of the opinion that the performance of individual sires should be stated in relation to the average performance of cows in the same environment and under similar management. The assumption that the daughters' yield is an exact blend of the parents' inheritances is not justified (see p. 72).

INDEX 2. THE MOUNT HOPE INDEX.

(a) When Daughters exceed their dams' production :—

Sire's Milk Index = $D + 0.429 (D - d)$.

„ Fat Index = $D + 1.5 (D - d)$.

(b) Where dams exceed their Daughters' production :—

Sire's Milk Index = $D - 2.333 (d - D)$.

„ Fat Index = $D - 0.677 (d - D)$.

Where D = Daughters' average production and d = dams' average production.

This index was evolved by Goodale (Ref. 7) and is at present used at Mount Hope Farm (Mass., U.S.A.) in listing bulls of the Guernsey breed. It aims at estimating the sire's transmitting ability in an inheritance where there is a partial dominance of high milk yield and recessiveness of high butterfat percentage. The fractions in the formula are derived from the results of Gowen's cross-breeding experiment (see p. 73) and their accuracy must be gauged in the light of the nature of those data.

INDEX 3.

Sire's index = Average production of Daughters.

This simple index has been shown recently by Gifford (Ref. 5) to indicate with reasonable accuracy the transmitting ability of a sire. The justification for leaving the dam's yield out of account is based on Turner's proof of the small *assessable* part which she plays in the inheritance.

The best way of deciding upon the relative merits of indices is to put them to the test. This can be done in the following manner; the dams of a sire's progeny are divided, according to their level of production, into two groups, "High" and "Low." The daughters of these groups of dams are also averaged and so for each bull three indices can be calculated: (1) an index based on his progeny from low producing dams, (2) an index based on his progeny from high producing dams, and (3) an index based on his total progeny from "All" dams. (In making the test only bulls with 10 or more daughters were used so that the sub-groups should not be too small.) The deviations of the indices of the sub-groups from the "All" group index are a measure of the accuracy of the index concerned. Theoretically, the three indices ought to be identical because the estimate of the sire should, if the index is fulfilling its main function, be the same irrespective of the dams to which he is put. An example by Index 1 (twice daughters' yield *minus* dams' yield) will make the nature of the test clear.

Level of Dams.	Yield of Dams.	Yield of Daughters.	Index of Bull.	Deviation from All Daughters.
	Lb. milk.	Lb. milk.	Lb. milk.	
All	9,330	7,010	4,690	—
Low	8,010	6,930	5,850	+1,160
High	10,660	7,090	3,530	-1,160

This sire, whose daughters average 7,010 lb. milk, is seen to have three different indices according to the level of the dams, i.e., 4,690 lb. when put to "All" dams, 5,850 lb. by his daughters from "Low" dams, and 3,530 lb. by his daughters from "High" dams. The first index is likely to be the most accurate one since it is calculated from the largest number of daughters. The others deviate from it by $\pm 1,160$ lb. By indexing 23 bulls with 10 or more daughters in this way the following average deviations for the three systems have been observed:

	Index 1.	Index 2.	Index 3.
Av. Deviation from Index of "All" Progeny—			
Low Dams	1,160	1,660	450
High Dams	1,160	2,450	450

The smallest deviations are those yielded by Index 3. This simple index (the average production of the daughters) is

seen to be influenced only to a very slight extent by the level of the dams from which the daughters come. (Actually in four cases the daughters from low producing dams gave more milk than those from high producing dams.) It does not prove that in assessing a bull the records or pedigree of the dams of his daughters should be entirely ignored, but the insignificance of the deviations observed for it in comparison with those for the other two indices shows clearly that the time has not yet come for sire evaluation by means of a formula into which the records of dams and daughters are fitted. The deviations for Index 2 are mainly negative for progeny from "high" dams and positive from "low" dams, so that a bull in use in a herd where the dams are low producers stands to benefit unduly and another in a high producing herd is penalised from the start. The average production of the daughters, then, is as good a single figure estimate of the bull as we possess, so long as we remember its distinct limitations. The great influences of environment and feeding and the fact that the nature of the individual yields comprising the average is more important than the average itself make it clear that a detailed analysis of all particulars available is necessary in the scientific evaluation of a progeny test.

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THE CULTURE OF LUCERNE IN GREAT BRITAIN.

HISTORY OF LUCERNE.

THE cultivated varieties of lucerne are derived from two wild perennial species of *Medicago*: purple-flowered lucerne (*M. sativa*) and yellow or sickle lucerne (*M. falcata*). The former is a native of Turkestan and is said to have been cultivated in Babylonia as early as 700 B.C. It is referred to by the Greeks as "the hay of the Medes," hence the name *Medicago*. It was brought to Greece about 490 B.C. and the Romans, who valued the crop highly, introduced it into Spain. There it was cultivated by the Arabs and subsequently by the Spaniards, who took it to America, where it still retains the Arabic name "Alfalfa." Its cultivation spread into most European

countries during the sixteenth and seventeenth centuries. Towards the end of the nineteenth century lucerne spread through the United States and was extensively grown in Canada, South Africa, Australia, New Zealand and the Argentine, in all of which countries there has been an immense increase in its cultivation within the last fifty years. Yellow lucerne (*M. falcata*) is a native of Siberia and is extremely hardy and drought resistant. Its low yield has prevented its extensive cultivation, but valuable varieties such as "Grimm" have been derived from crosses of this species with *M. sativa*. Such varieties have retained frost- and drought-resistant qualities derived from their Siberian parent.

THE PLANT AND ITS ADVANTAGES.

The lucerne seedling, after developing a main shoot and root, gives rise, from near the soil surface, to fresh shoots, which rapidly grow to a size nearly equal to the primary shoot, resulting in a bushy habit of growth. At about the time of flowering a fresh set of buds appear at the base or "crown" and, from these buds, secondary shoots develop after the first growth has been cut. The continued formation and growth of such buds at the crown makes it possible to obtain several cuts of lucerne during the season. In this country two or three cuttings can be obtained during the year from established lucerne. Trials at 14 centres distributed over the South-west, the Midlands and the North of England gave yields averaging 5 tons 1 cwt. of green lucerne per cutting. These figures do not refer to the seedling year, in which an average yield of about 3½ tons was obtained. The crop has a very high feeding value. The figures in Table I are taken from the Ministry's publication, "Rations for Livestock" (5th edition, 1927), and compare various types of feed.

The total protein percentages given for lucerne in this table represent the following percentages of protein, calculated on a dry matter basis: Green lucerne, 18.75; lucerne hay, cut before flowering, 19.3; lucerne hay, cut in full flower, 17.0. In the trials above referred to, analysis of 23 samples taken from 13 centres gave 20.1 per cent. of protein in inoculated, and 17.8 per cent. in uninoculated, lucerne, on a dry matter basis.

Lucerne is rich in phosphorus and in lime and so acts as a safeguard against mineral deficiency. It is also rich in vitamin A, which is known to exert a marked influence on the growth of young animals.

The other advantages of lucerne are connected with its remarkable root system. The plant forms a tap root of great length and tends to develop fibrous lateral roots in the deeper

TABLE I.

	Average Composition per cent. as shown by analysis.						Digestible Nutrients. Per cent.				
	Dry Matter.	Protein.	Oil.	Carbo-hydrates.		Ash.	Crude Protein.	Pure Protein.	Oil.	Carbo-hydrates	
				Soluble.	Fibre.					Soluble.	Fibre.
GREEN FEED :											
Sugar beet leaves and crowns . . .	19.5	2.4	0.4	8.8	3.0	5.4	1.6	1.1	0.1	7.3	2.3
Alsike . . .	15.0	3.8	0.6	5.1	4.5	1.5	2.1	1.5	0.4	3.6	2.2
Red clover, beginning to flower . . .	19.0	3.4	0.7	8.1	5.2	1.6	2.5	1.7	0.5	6.3	3.0
Sainfoin, in flower . . .	20.0	3.5	0.6	7.8	6.9	1.2	2.3	1.6	0.3	4.8	3.2
Tares, in flower . . .	17.5	3.2	0.5	7.2	5.1	1.5	2.2	1.4	0.3	4.9	2.3
Lucerne, beginning to flower . . .	24.0	4.5	0.8	9.6	6.8	2.3	3.2	1.7	0.4	6.3	2.9
HAY :											
Clover, good red . . .	33.5	13.5	2.9	37.1	24.0	6.0	8.5	5.5	1.7	26.0	11.3
Meadow hay, good . . .	35.7	9.7	2.5	41.0	26.3	6.2	5.4	3.8	1.0	25.7	15.0
Meadow hay, very good . . .	34.0	13.5	3.0	40.5	19.3	7.7	9.2	6.5	1.5	30.1	12.7
Meadow aftermath, good . . .	35.2	11.5	3.4	39.3	22.5	8.5	6.9	5.6	1.6	26.1	14.0
Italian Rye Grass . . .	35.7	11.2	3.2	40.6	22.9	7.8	7.1	4.9	1.4	26.6	14.9
Sainfoin, in flower . . .	33.5	13.2	2.5	32.5	28.0	7.3	9.6	7.5	1.6	25.3	11.8
Tares, in full flower . . .	33.8	14.2	2.5	32.3	25.5	8.3	9.4	6.6	1.5	19.7	12.8
Seeds hay (rye grass and clover) . . .	36.0	12.0	2.8	37.4	27.5	6.3	6.2	3.6	1.2	22.0	13.2
Lucerne, before flowering . . .	34.0	16.2	2.4	31.1	27.0	7.3	13.1	8.1	1.1	21.1	11.3
Lucerne, in full flower . . .	33.5	14.2	2.6	29.2	29.5	8.0	9.7	6.2	1.2	18.1	13.2
CAKES :											
Cotton cake, Egyptian . . .	37.9	23.0	5.5	32.4	21.2	5.8	17.6	16.6	5.1	17.5	4.5
Cotton cake, decorticated . . .	30.2	40.2	9.9	25.9	7.6	6.6	34.6	33.1	9.3	17.3	2.1
Linseed cake, English made . . .	33.8	29.5	9.5	35.5	9.1	5.2	25.3	23.9	8.7	23.5	4.5
Palm nut kernel cake, English made . . .	39.0	18.8	7.7	45.3	13.4	3.8	17.1	16.0	6.3	33.5	5.1

layers of the soil. In a suitable subsoil, the roots may descend 50 feet or more. This root system is effective in breaking up the subsoil, thus improving the physical quality of the land, and it brings up plant nutrients from the deeper layers of the soil, where they would otherwise be inaccessible. Its deep root system also confers upon the plant its valuable power of drought-resistance, making it a stand-by in a dry summer.

Like those of other legumes, the roots are infected with nodule-forming bacteria, provided that the right variety of these organisms be present in the soil. Some of the nitrogen compounds built up by these bacteria are left behind in the soil when the roots and their nodules decay, and this nitrogen benefits subsequent crops. The residual value of lucerne

is well established by practical experience. Finally, lucerne has the advantage of being perennial. The long stands recorded abroad are rarely obtained in England, but an established lucerne ley should last in this country from four to seven years.

The acreage under lucerne in Great Britain has not shown any great increases during the past half century. In 1929 it was as low as 35,783 acres, and this in spite of the advantages of the crop and in strong contrast to the great development of its cultivation in other countries. The crop seems to have been introduced to this country about the middle of the seventeenth century. Sale of the seed in London is referred to in Hartlib's "*Legacie, or an enlargement of the Discourse of Husbandry*," published in 1655. Since then it has been grown principally in the south-eastern quarter of England; until recently it has been only occasionally sown in other districts, and usually with discouraging results. Farmers have usually attributed its failures in these other districts to unsuitable soil and weather conditions, but there is now evidence that the principal cause of failure is the general absence from the soil of the nodule bacteria appropriate to lucerne, in whose absence the crop cannot thrive unless well supplied with nitrogen compounds.

LUCERNE INOCULATION.

Lucerne occupies a peculiar position with regard to its nodule bacteria. The nodule bacteria which infect legumes can be divided into a number of varieties each of which is able to infect only a small group of host plants. That variety which infects lucerne is usually absent from new areas in which the crop is sown and, until this appropriate bacterium is introduced, the plant will not develop nodules or derive the benefits from nitrogen fixation. It has been found that commercial samples of seed usually carry with them a very small number of lucerne bacteria, probably derived from dust raised from the soil in the process of gathering the seed. It seems likely that the soil in the south-eastern counties has gradually become infected with lucerne bacteria derived from this source. This natural process of infection, however, may take years before the soil contains sufficient numbers of the bacteria to produce a good crop of nodules. It is, therefore, desirable and usually necessary in new areas to introduce the bacteria artificially at the time the crop is sown. There are two methods of doing this. One method is to spread soil from a field that has carried a good lucerne stand, over the land where a new crop is to be sown. This method is practicable only where the two fields are close

together and is unsuitable where lucerne is being introduced into a new district. The second and much simpler method is to convey the bacteria to the soil together with the seed, by treating the latter with a bacterial culture, a process known as "seed inoculation." Early attempts at seed inoculation in this country gave disappointing results but research has now improved the method in several directions. In the first place culture media have now been developed upon which the bacteria can be grown for a long period without losing their effectiveness. In the second place it has been found that the bacteria, when in the soil, pass through a life-cycle in a certain stage of which they become motile. The bacteria are only able to infect the roots and cannot penetrate the seed, which is used merely as a means of conveying them to the soil; it is, therefore, necessary that they should pass into the motile condition so that they can find their way to the lucerne roots. A process of applying the bacteria to the seed has now been developed which stimulates them to become motile when they reach the soil.

The method now used is carried out as follows: the farmer receives the bacterial cultures growing on agar jelly in test tubes, one of which is sufficient to treat 14 lb. of seed. The farmer mixes the culture with skim milk to which he has added 0.1 per cent. calcium phosphate, a sufficient quantity of which is sent with the cultures. The seed is placed in a bucket or on a clean floor and wetted with the milk containing the bacteria. It is then spread out until *thoroughly* dry and may be sown at once, although, should immediate sowing be impracticable, a few days' delay will not seriously impair the efficiency of the inoculation. Cultures for the treatment of lucerne can be obtained from Messrs. Allen and Hanburys, Bethnal Green, London, E.2.

When the above process of seed inoculation had been developed a series of field trials was carried out at 29 centres distributed over Great Britain in order to discover whether there were districts where the process was needed and whether the successful growing of lucerne was possible in western and northern areas by using inoculated seed. This work was commenced in 1924 and was carried out with the help of a grant from the Royal Agricultural Society. It is possible, from their results, to divide the country into districts according to the effects of inoculation. In the south-west, west and north every centre showed a benefit from the treatment and the uninoculated lucerne often failed completely. In these areas the benefit of inoculation was usually apparent for as long as the crop stood. Some of the results obtained in the area are shown in Table II. Yield figures in *italics* refer to green weights; the others, to hay.

TABLE II.

RESULTS OF LUCERNE INOCULATION EXPERIMENTS IN SOUTH-WESTERN AND NORTHERN AREAS.

Experimenter.	Yield in cwt. per acre, from single cuttings.			Percentage of protein in dry lucerne.*	
	Inoculated.	Untreated.	Gain due to inoculation in cwt. per acre.	Inoculated.	Untreated.
Col. E. P. Brassey, Gloucester	109.3	32.5	76.8	15.8	13.1
G. Sheaf, Gloucester	44.7	32.5	12.2	20.9	20.6
A. T. Cake, Dorset	20.9	17.0	3.9	—	—
Lord Clinton, Devon	53.0	34.0	19.0	24.4	19.6
G. H. Johnstone, Cornwall	61.5	41.9	19.6	21.2	20.6
Clarke & Sons, Somerset	31.8	66.8	15.0	25.8	25.7
G. Harrison, Montgomery	87.1	55.0	32.1	15.9	16.6
Welsh Plant Breeding Sta., Cardigan	192.7	174.2	18.5	—	—
Pennell & Sons, Lincoln	151.5	125.5	26.0	16.5	16.0
W. R. Strickland, Yorks.	100.0	62.1	37.9	21.2	13.8
J. Walker, Durham	173.0	87.4	85.6	—	—
W. Low, Kincardineshire	43.3	34.3	14.0	—	—

* The figures for protein percentage are based on the nitrogen percentages found in samples of each crop multiplied by 6.25.

In the central area most centres showed a benefit from inoculation (Table III). This benefit usually showed in the first season or two, after which the untreated plots improved until they equalled those treated. This strengthening of the young plant by inoculation is, however, of importance in a bad season, so that inoculation is a wise insurance in this area.

TABLE III.

Experimenter.	Yield in cwt. per acre, from single cuttings.			Percentage of protein in dry lucerne.*	
	Inoculated.	Untreated.	Gain due to inoculation in cwt. per acre.	Inoculated.	Untreated.
W. Lawson, West Sussex	211.6	137.2	24.4	22.2	21.0
Col. Lyon, Cheshire	118.3	110.7	7.6	28.8	24.9
Woburn Experimental Sta- tion, Beds.	35.0	30.3	7.2	19.9	10.3
A. A. White, Oxfordshire	22.3	21.9	0.9	18.7	19.0
Oaklands, Hertfordshire	219.0	167.6	51.4	—	—

* The figures for protein percentage are based on the nitrogen percentages found in samples of each crop multiplied by 6.25.

In East Anglia and Kent inoculation is usually unnecessary as the soil commonly contains the lucerne organism in sufficient numbers. At one centre in Suffolk (Tunstall Heath), however, inoculation was beneficial. At this centre there is a light acid soil in which the bacteria cannot long survive. On such acid soils both liming and inoculation are necessary even where the lucerne bacteria commonly occur in the district, since they do not survive in an acid soil.

The general result of the trials, therefore, has been to show that it is always advisable to inoculate lucerne in districts outside East Anglia and Kent and in all districts, including East Anglia and Kent, where the soil is acid and where liming has been found to be necessary. Subsequent experience has shown that with inoculation the prospects of success with lucerne on suitable land in the west and north of England are as good as in the south-east. There has already, during the past three years when cultures have been on sale, been an appreciable increase in the relative acreage in these new districts as compared with the total acreage for England and Wales. Table IV shows the acreage in the districts outside the south-eastern counties, as a percentage of the total acreage, for each of the past six years. (During 1928 and 1929 a small number of cultures were sent out to farmers direct from Rothamsted.) Seed inoculation has thus made it practicable to grow lucerne in districts where many farmers may not be experienced in its cultivation. Indeed, further experiment is still necessary to determine whether the methods most popular in the eastern counties are best suited to the climatic conditions of the west and north. Some discussion of the principles governing the culture of lucerne may, however, be useful in order to assist growers in new areas towards the best method of lucerne husbandry.

TABLE IV.

Year.	1927.	1928.	1929.	1930.	1931.	1932.
Cultures.	No issue.	Experimental issue.		Commercial issue.		
A Total lucerne acreage in England and Wales	43,563	37,104	35,783	39,781	46,120	39,410
B Lucerne acreage in south-eastern counties	30,333	25,809	24,409	26,459	29,740	26,150
C Lucerne acreage in remaining counties	13,230	11,295	11,372	13,322	16,380	13,260
D C as a percentage of A	30.4	30.4	31.8	33.5	35.5	33.6
E Three-year average percentages	30.8			34.8		

(Figures extracted from the Ministry of Agriculture's statistics; the figures for 1932 were subject to revision.)

WEED INFESTATION.

Seed inoculation aims at supplying nitrogen to the plant and it is clear that there are many causes of failure which will affect lucerne even when inoculation has rendered the plant independent of soil nitrates. When cases of lucerne failure were investigated, it was found that, in the majority, the failure was associated with heavy weed infestation. This question of weeds is so important that the method of growing the crop must have weed control as one of its main objects.

There are three principal periods in the life of the crop when it seems especially liable to damage from weeds. In the seedling stage lucerne grows rather slowly and, when sown in the spring, it is liable to be swamped by weeds that spring up in early summer unless the land be very clean. There is a second period of danger in the autumn from such weeds as groundsel and chickweed. Damage from such autumn weeds is generally due to the plant making a bad start or to its having been sown too late, so that it has had no time to become sufficiently strong to resist the weed competition. Finally, an old lucerne stand is apt to become infested with grass. This may be due to inadequate harrowing in winter or may be a symptom of the weakening of the lucerne from some other cause. Indeed, weed infestation would seem in many instances to be itself a symptom of a weak lucerne plant due to the wrong soil or incorrect management; the plant should be able to choke the weeds if grown under good conditions and given a fair start.

SOIL TYPES.

Lucerne is essentially a deep-rooting plant and it is not suited by a shallow soil which lies over unbroken rock, dense chalk, or hard-pan. It needs a porous or fissured subsoil so that its long roots can penetrate easily. Hence lucerne is often thought not to be a plant for chalky land, but it frequently succeeds on shallow soil overlying chalk if there are cracks which the roots can follow. Since the roots cannot live in standing subsoil water, an undrained subsoil is as bad for lucerne as is impervious rock; a water table near the surface, which may not affect shallow-rooting plants, is usually fatal to lucerne. The ideal situation for lucerne is a deep loam over a porous subsoil.

LIMING AND ITS PURPOSES.

The soil must be neutral; lucerne will not thrive if lime is deficient. Not only does the lucerne *plant* require lime, but the nodule bacteria die out in an acid soil. Lime is best applied in the season previous to sowing the lucerne, especially when the coarser forms of lime, such as limestone or native chalk, are used. If lime is to be applied just before sowing, one of the more finely-divided and quickly-acting forms should be selected. Slaked lime or sugar-beet factory sludge is thus to be preferred to ground limestone or chalk, if it is desired not to lose a season. The quantity to be applied will depend upon the condition of the soil; a minimum dressing of 1 ton of burnt lime or its equivalent to the acre is suggested.

Except on nearly neutral soils, basic slag, when used as a phosphatic manure, should not be deemed to be a substitute

for liming. Basic slag may be considered to be equal in lime content to its own weight of limestone, and dressings of slag do not usually exceed 5 cwt. per acre on arable land. Nitrogenous forms of lime, such as cyanamide, are not recommended for lucerne. It should be borne in mind that the purpose of the lime is not only to "sweeten" the soil, but to supply the large amount of lime which the lucerne will need and which will subsequently be available to the stock fed with it.

MANURING BEFORE SOWING.

Lucerne is a rather greedy feeder. It likes a good loam, as has already been stated; this means that it flourishes better in a seed-bed rich in humus. Farmyard manure freshly ploughed in is of doubtful benefit, especially as it tends to encourage the growth of weeds, but a previous application of farmyard manure is of great value to lucerne, which thus can be provided with its most favourable conditions without drawing expressly upon the dungstead. The value of farmyard manure, as the previous season's dressing, to a new crop of lucerne lies in the promotion of tilth and the retention of surface moisture, rather than in its residual manurial constituents.

Lucerne is able to secure from the air all the nitrogen it needs, and nitrogenous manure seldom benefits it. Lucerne should be looked upon as a source of nitrogen, and not as a crop which requires the expending of nitrogenous fertilisers.

Some growers recommend the addition of a small dose, say half a hundredweight per acre, of nitrate of soda to lucerne at the time of sowing, with a view to enabling the young plant to get a good start. It is doubtful whether there is a real advantage in this practice, since nodules should rapidly develop on a healthy plant and provide all the nitrogen that is needed. It is therefore of great importance that well-developed nodules should be formed as early as possible. In recent experiments made at Rothamsted, quite small doses of nitrate of soda considerably reduced both the number and the activity of the nodules. This was true whether lucerne was grown alone or in mixture with grass.

In those experiments where lucerne was grown with Italian rye grass, increasing doses of nitrate caused actual decreases in growth of the lucerne, and also reduced the protein content of the mixed crop. This of course is due to the nitrate stimulating the grass to compete with the lucerne. Thus the farmer who applies nitrate to such a mixture can expect no return for his expenditure. It must also be remembered that nitrogenous manures will stimulate weeds to compete with lucerne.

Just as a German chemist said, "No thought without phosphorus," so it might be said, "No phosphates, no lucerne." Phosphatic fertilisers are the most important form of manuring to lucerne, not only because the plant needs phosphorus, but also because fixation of nitrogen cannot occur without an adequate supply of phosphates. Phosphorus in farmyard manure is in deficient amount, relatively to the other constituents, and it should not be expected that a dressing of farmyard manure will supply all the phosphorus that is required. In any case, from 3 to 5 cwt. per acre of superphosphate or of high-grade basic slag (finely-ground and of at least 80 per cent. citric acid solubility) should be given before sowing lucerne. High-soluble slag, being quick acting, is of much greater value to the young lucerne plant than low-soluble.¹

On heavy soils the addition of potash is often unnecessary. The young plant's requirements can be met from the surface soil, if that has had a dressing of farmyard manure the previous year; and the deep roots of older plants are able to obtain a sufficiency of potash from the subsoil, unless that is very chalky. On light sandy or gravelly soils, or where chalk lies near the surface, potash as muriate, sulphate, or 30 per cent. potash salts, is sometimes beneficial. An initial dressing of not more than 2 cwt. per acre would seem to be ample.

There is, however, real scope for further field experimentation on the manuring of lucerne, particularly with regard to its need for potash.

Manures will usually be applied during the preparation of the seed-bed. No loss is to be expected if basic slag is applied in the previous autumn. It is very desirable that manures applied before sowing shall be intimately mixed with the soil. If lucerne is to be sown in a cover crop, the mineral manures may be applied when the cover crop is sown, and no further application of phosphate or potash need be given at the time of sowing the lucerne.

MANURING AN ESTABLISHED CROP.

During its first year a satisfactory piece of young lucerne will require no manure additional to that given at the time of sowing. In subsequent years a dressing of superphosphate may be given with advantage after the first cutting and before

¹ An article by Mr. H. V. Garner ("Notes on Manures," *Journal of the Ministry of Agriculture*, October, 1932) contains information valuable to the prospective user of slag. The differences in kind of slags are pointed out. "High-soluble" slag (that which gives a high figure for solubility by the citric acid test) is not sold subject to warranty as to solubility, but if a statement respecting its solubility is obtained from the vendor, that statement has the force of a guarantee.

harrowing or hoeing. Lucerne provides much mineral matter for stock ; for this reason it makes considerable demands upon the soil, and superphosphate application will be well repaid.

Annual applications of potash may, in addition, be advisable on poor light land ; in an experiment carried out at Bramford (Suffolk) from 1895 to 1900, the average yield per acre of lucerne for the six years was increased from 45 to 61 cwt. by annual dressings of 1 cwt. of muriate of potash.¹ Lucerne is most economically top dressed by means of artificials ; farmyard manure, unless it is abundant, should be saved for other crops.

PLACE IN ROTATION.

On account of its long stand (from four to six years' cropping may confidently be expected before the crop is poor enough to plough under) lucerne does not fit easily into ordinary rotations, and this fact is sometimes brought forward against it. The farmer accustomed to long leys, and the farmer who is quick to see the advantages of a richly productive drought-resisting arable crop which requires less labour than an annual crop, will find a place for a piece of lucerne without unduly stressing its non-conformity to a four- or six-year rotation.

Lucerne can follow any crop, and can be followed by any crop. It thus falls readily into any flexible system of cropping. It is probably best to let lucerne follow a hoed crop such as roots or potatoes : this ensures a good seed-bed for the lucerne, which also benefits from the dung applied to the root crop. For early potato districts it has been recommended to sow lucerne as soon as the potatoes are lifted—usually about August. Where the climate is mild this time of sowing involves the young lucerne in little risk of frost killing, but it does not enable a cutting to be made in the first year. It is a practice in parts of Germany having a long tradition for sugar-beet growing to grow lucerne before the beet. The Klein-Wanzleben sugar factory has informed us that sugar-beets are sown on their farms after potatoes, peas or lucerne and that the highest yield is obtained after lucerne. They also state that lucerne reduces the danger of the beet suffering from eel-worm attack. These are typical points upon which experiment in this country is needed to determine whether the system would suit our conditions and, in particular, whether it would expose the sugar-beet to any increased danger of wireworm.

COVER CROP ; GRASS MIXTURES.

It is the practice of many farmers to sow lucerne in a light cover crop of oats or barley. In most cases the cover crop,

¹ For details, see Bulletin 28 of the Ministry of Agriculture and the Report of the East Suffolk Education Committee for 1907.

unless it is a very light one, will delay the early growth of the lucerne and, on the other hand, will make it impossible to deal with early weeds, should the cover crop not be strong enough to swamp these by itself.

The advisability of sowing lucerne in a mixture with grass is a question which requires further experiment in the wetter districts. Where the lucerne is kept very clean, there is evidence that a lucerne and grass mixture, while it may yield a slightly higher bulk of crop than pure lucerne, will not give so much feeding value per acre as lucerne grown alone, owing to the lower protein content of the grass. But in a wet season, when weed trouble is liable to be acute, the grass will tend to choke the weeds, so that the mixture may give a satisfactory crop when lucerne alone would have failed. Lucerne grown with grass also provides a ready-mixed green feed less likely than pure lucerne to cause bloating of cattle and sheep, and it yields a crop whose lower nitrogen content makes it more suitable for making silage. In the recent Ministry of Agriculture publication No. 31, "Ensilage," it is suggested that 20 lb. of lucerne seed and 5-10 lb. of ryegrass make a suitable mixture for a silage crop.

Where lucerne is grown with a non-legume, it is especially vital that the lucerne should develop a plentiful supply of nodules at as early a stage as possible, since, until this development occurs, the lucerne will be dependent on the soil nitrates, for which the non-legume will also compete. It is, therefore, particularly important to inoculate lucerne seed which is to be sown either in a cover crop or with grass.

VARIETIES ; WINTER-KILLING.

A few strains of English seed are available but the amount of English-grown seed is limited, as lucerne does not often set seed in this country. Breeding trials with lucerne are in progress at the Imperial Bureau of Plant Genetics (Herbage Plants), Aberystwyth. The varieties of lucerne most commonly grown in Great Britain are Provence and Grimm. Capt. G. H. Johnstone, of Grampound Road (Cornwall), made some trials of Grimm and Provence seed, in connection with inoculation trials, in the seasons 1925, 1926 and 1927. His results are given in Table V. Seed was sown on 16th May, 1925.

The National Institute of Agricultural Botany carried out a variety trial with lucerne at Long Sutton, Hants, from 1925-1930. (See *Journ. Nat. Inst. Agric. Bot.*, 1931, Vol. III.) Hungarian lucerne gave yields higher than Provence during 1926 and 1927, but after that gave about the same yield as Provence. Grimm gave a yield significantly above Provence in 1926, but significantly below in 1928, 1929 and 1930. In 1927 the yields

TABLE V.
WEIGHTS IN CWT. OF GREEN LUCERNE PER ACRE;
AVERAGE OF AT LEAST TWO PLOTS.

Cutting date.	Grimm.	Provence.
September 1925	51.7	36.7
July 1926	94.0	29.2
September 1927	49.0	36.5
Totals	194.7	102.4

of the two varieties were the same. Kansas and South African seed did not do well; usually it has appeared that varieties brought from distant warm regions do not suit British conditions. The discrepancy between the findings in Hampshire and in Cornwall with regard to Grimm is very likely due to season or to differences of strain. Widespread variety trials with lucerne are still necessary.

It seems that the dangers of frost are apt to be exaggerated by some advisors, but resistance to frost is genuinely important in the North. While Provence is the variety most favoured in East Anglia, and is apparently good for the south and south-west, Dr. Cunningham found that Grimm was the only variety tried which would stand up through the winters in East Lothian. The qualities of Grimm appear to be due to its habit of root growth which enables it to send out fresh roots to replace those killed, and so to withstand frost-heaving to some extent. Detailed information concerning the root habit of lucerne is contained in U.S. Department of Agriculture Bureau of Plant Industry circular No. 115. A history of the principal species and varieties of lucerne is available (to readers of German) in O. Heuser's admirable book *Die Luzerne* (Berlin, Paul Parey, 1931).

SOWING.

Sowing is usually done in April or May. The spring-sown lucerne becomes firmly enough established to acquire a resistance against weed infestation, which is usually most severe in autumn. It is better to drill than to broadcast the seed, as drilling enables it to be sown at the proper depth and makes subsequent weeding an easier matter.

It cannot be too strongly emphasised that lucerne requires a firm seed-bed. The land should first be rolled, and the seed should be drilled at the rate of 20 to 25 lb. per acre in rows about 12 inches apart, and with the coulters set to cover the seed not more than 1 inch deep. The land should then be

well rolled again. The width of row recommended is that which makes subsequent weeding easy for a horse-hoe ; slightly narrower drills defeat their intended object as they either help the growth of weeds or tend to injury of the plant when the hoe is used. Some farmers advise drilling in very close drills, in the hope that the lucerne will thus swamp the weeds by itself. This practice is safe only in the drier districts on very clean land. In any case, an intermediate drill width of about 9 inches should be avoided, as this enables the weeds to grow between the rows and does not enable a horse-hoe to be run between them. Within reasonable limits the yield of a clean crop is not affected by spacing of the rows. Lucerne seed should be sown at the same depth as clover seed, which it resembles. Sowing more than 1 inch deep will result in buried seedlings and a poor stand, owing to uneven germination.

AFter-CULTIVATION.

During the seedling year it is essential that lucerne should be kept free from weeds, and frequent hoeing will usually be well repaid. It is dangerous to harrow lucerne in its first year, but, when established, heavy harrowing in the spring is the best method of keeping down weeds. Harrowing improves the lucerne stand by breaking up and aerating the soil. It has been recommended to use the harrow after every cutting. After-cultivation of lucerne, however, is not a satisfactory substitute for a clean seed-bed.

In view of the importance of the crown it may appear strange that heavy harrowing should be recommended ; some growers even use a disc harrow. The use of a disc harrow implies that the discs are set to go between the rows and not through the crowns. In using an ordinary toothed harrow some of the crowns are sure to be cut, but the cut crowns are usually relatively few in number and in any case they would be only split, and not cut off. The damage resulting from a harrowing is negligible ; much more harm can result from using a horse-hoe or cultivator between narrowly-spaced rows. For this reason it has already been suggested that the rows, where the crop is to be horse-hoed, should be not less than 12 inches apart.

CROPPING : WHEN TO CUT.

American research on the time of cutting lucerne has shown that it should not be cut until it is in flower. It is true that in the bud stage, the top is richer in protein than at any other time, but cutting in this early stage greatly weakens the plant and ultimately shortens the life of the stand. At about the

time of flowering, fresh shoots break from the crown. It is only after the breaking of these new shoots that a cut can be made without damage to the plant. In this country, where blooming may be irregular, the development of the new shoots is indeed the best indicator of ripeness for cutting.

In this country it is usually possible to get one cutting from spring-sown lucerne in its seedling year, and two or three cuts in each subsequent year. It is important that the crop should not be cut too late in the season. The last cutting should not be made after the middle of September: growth made after that time should be allowed to act as a mulch to protect the crowns from frost. Too late cutting gives the lucerne no time to make this protective growth and so is a common cause of winter-killing. In the last year of a lucerne stand, however, the farmer is justified in pasturing his lucerne very closely in the autumn or in cutting it late in order to kill the plant.

EFFECT ON FOLLOWING CROPS.

There is some evidence that lucerne when grown in mixture with a graminaceous crop increases the uptake of nitrogen of that crop. In a sand culture experiment made at Rothamsted, Italian Ryegrass sown with lucerne took up some of the nitrogen fixed by the lucerne within three months of sowing. The mechanism of such a transfer is at present obscure. Lucerne will increase the yield of a subsequent non-leguminous crop as surely as does clover in a rotation. Lucerne is much more deeply rooted than clover, and the value of ploughed-in lucerne as an enrichment for the soil is beyond dispute. The advantage gained from what would to-day be called the residual value of lucerne has been known empirically since Roman times. The figures in Table VI record the results of an experiment performed at Rothamsted. Some of these have been quoted by Dr. A. Cunningham in the *Scottish Journal of Agriculture* (Vol. XI, 1928).

Barley following lucerne has given an increase of 16.66 bushels in the second year as compared with barley following red clover. Oats in the first year (1912) gave a similar result. To obtain this increase by means of artificials one would need to apply about 3 cwt. of sulphate of ammonia per acre as a top dressing. A similar conclusion has been drawn from experiments in Austria and in the United States. The residual effect of lucerne lasts for a number of years. Mr. Christopher Turnor took eight good crops without nitrogenous manuring from a field which had carried lucerne for 5 years, though this result was obtained on exceptionally good soil. Unfortunately

no other figures could be found which would allow an estimate of the length of time during which this residual effect persisted. Here again is a point upon which repeated experimental evidence from this country is lacking.

TABLE VI.

HOOSFIELD, ROTHAMSTED, BARLEY AFTER VARIOUS LEGUMINOUS PLANTS.

Each plot 0.56 acre.

	Quantities per acre						Particulars of Quality.	
	Dressed grain.		Offal grain.	Total grain.	Total straw.	Total produce.	Weight per bushel dressed grain lb.	Proportion of offal grain to 100 of dressed
	bushels.	lb.	lb.	lb.	cwt.	lb.		
SEASON 1913.								
<i>After Oats 1 year and</i>								
Lucerne 7 yrs. . .	55.17	3,217	47	3,264	26.4	6,218	58.8	1.5
Red clover 3 yrs. . .	88.51	2,202	82	2,234	18.8	4,839	57.2	1.4
Alsike* 3 yrs. . .	85.05	2,000	81	2,081	17.9	4,087	57.1	1.6
SEASON 1914.								
Lucerne plot . . .	82.97	1,764	125	1,889	17.5	3,853	58.5	7.1
Red clover plot . . .	20.26	1,080	78	1,158	10.6	2,847	53.8	7.2
Alsike plot . . .	21.94	1,182	73	1,255	11.8	2,522	53.9	6.2

* It is recorded that the alsike plot was mostly grass at this time.

HAY.

Roughly two-thirds of the feeding value of lucerne is in the leaves, which are prone to fall off and be lost. For this reason lucerne hay requires gentle handling and careful harvesting. To reduce loss of leaves, curing should be done in the cock as far as possible, and raking and turning should be done while the lucerne is still pliant. Green lucerne is particularly liable to heat in the stack. Stacking before the hay is properly cured may result in heating or fermentation, which yields a brown hay. The practice of drying the hay on hurdles or similar structures, which is employed in Germany and Scandinavia, seems very suitable to our wetter districts. Climatic conditions—especially in the wetter districts of England—will often limit hay-making to the first cut. The later cuts may be fed green or, if not allowed to stand so long as to become unduly stemmy, made into silage.

Cutting lucerne after heavy rain is harmful, but too much exposure of the cut lucerne to the sun should be avoided as over-rapid drying tends to dry the leaves so that they are easily detached from the stalks. The effect to aim at is to secure a

slow uniform curing so that the leaves can remain on the plant and assist in exhaling the moisture contained in the stem. Rapid drying results in a poor moist hay, deprived of its valuable leaves but retaining considerable moisture in the less valuable stems. No purpose would be served by giving more detailed directions for making lucerne hay since the best method will depend so much on local conditions.

HAY-CAPS.

In the wetter parts of the United States hay-caps are often considered to be worth their cost. They consist of pieces of stout cotton cloth about 60 inches square which are put over the cocks at night or before a threatened shower. The cloths are weighted or pegged down. Professor Storey, in his *Agriculture*, says of these caps that they hold in the raked-up warmth, keeping the hay from cooling off. This benefit is additional to the advantage derived from the caps in case rain should fall before the cocks are opened. It is a further considerable advantage of caps that they prevent dew from settling on the hay, and they thus conserve colour and aroma.

LUCERNE AS FODDER FOR DAIRY COWS.

Lucerne is an especially valuable food for dairy cattle—a fact that has long been known in this country (see Prof. James Long's paper, *Journal of the Royal Agricultural Society*, Vol. 23 (1887), p. 141). This is due not only to its high protein content, but also to its richness in mineral constituents and in the fat-soluble vitamin A.

During a discussion on a paper on rationing dairy cows for milk production, given at the Farmers' Club in 1926, Mr. Christopher Turnor said: "Lucerne is a foodstuff with a very high albuminoid ratio, far cheaper per unit than anything that can be bought. In the case of my own dairy herd, which consists of over 200 cows, lucerne forms a very important part in the feeding; in fact, it forms the bulk of the concentrated food. I happen to feed it as hay in winter, though I do not regard it as hay, but as a substitute for cake. My cake bill has greatly been reduced by the use of lucerne, as you will see when I tell you that my heaviest milking cows (giving about 800 gallons) receive only 6 lb. of ground nut cake a day. The rest of the albuminoid ration is made up with lucerne to 10 or 15 lb. a day. I submit that the full use of lucerne can do more to reduce the cost of producing the milk than perhaps anything else." When soiled to dairy animals, lucerne should be given sparingly at first, but animals accustomed to it will eat large quantities without harm.

Recent experiments made by the National Institute for Research in Dairying indicate that a yearling shorthorn heifer

can make satisfactory progress throughout the winter on a diet of 12–14 lb. of lucerne hay and 30–40 lb. of mangolds per day, without the addition of any concentrates. These winter-keep experiments (of which the result is given in the Annual Report of the Institute for 1931) are to be continued. The importance of lucerne on the dairy farm is emphasised because the use of inoculation now enables the crop to be grown in many dairying districts where it was previously impossible to obtain satisfactory lucerne crops.

GRAZING.

The grazing of lucerne requires great care. English authorities are divided in their views as to its advisability, though animals grazed on lucerne have done well abroad when care has been exercised in adapting cattle and sheep gradually so that they do not get hoven.

Grazing affects the stand as well as the animal; lucerne can easily be damaged by grazing it too close, too frequently, or too late in the year. Lucerne should not be grazed so hard that the crown is damaged, and a sufficient growth should be left upon the crowns at the end of the year to provide some protection against frosts.

LARGE-SCALE DRYING.

Lucerne hay can be made efficiently and rapidly by passing a current of warm air through the cut lucerne. The equipment is necessarily expensive, and its use would suggest co-operation between adjacent farms. Against the cost of the process should be set any saving effected by the larger yield and better product secured owing to avoidance of loss of leaves—the most nutritious part of the crop.

In the wetter parts of the United States, such artificial curing has been the occasional practice during the last twenty-five years. In most cases the hay produced by this process is considered to be superior to lucerne hay as ordinarily made in the field, and to retain valuable properties present in the green forage, but largely lost during field curing (see *Journal of Agricultural Research* (1932), Vol. 45, pp. 507–511). The hay made by artificial drying has also been reported to be eaten by stock in preference to ordinary lucerne hay. It has been claimed that artificial drying sterilised weed seeds. A meal mill might economically be worked in conjunction with a drying installation.

LUCERNE MEAL.

Owing to American influence, lucerne meal is frequently called alfalfa meal in this country. It is not yet produced in

quantity in Great Britain, but is imported. It is not truly meal, but consists of lucerne hay ground or cut to a condition of fine chaff; it is sometimes mixed with molasses to make it more palatable. The simple meal appears to have originated in the United States about the end of last century; one of the advantages claimed for it was reduction in cost of transport. The use of alfalfa meal was rapidly taken up by large-scale poultry farmers who were not slow to seize the opportunity of giving their birds the valuable foodstuff which had formerly been available principally to large stock. It is now recognised that lucerne meal is of especial value to poultry keepers for two reasons: it provides some of the needed minerals, and it is said to confer deep colour upon yolk.

Lucerne meal is considerably handier than lucerne hay: a ton of lucerne meal occupies only 100 cubic feet, whereas a ton of unbaled lucerne hay occupies some 500 cubic feet and baled lucerne hay takes up about 220 cubic feet.¹ By grinding lucerne on the farm where it is grown, waste from loss of leaves during transport is diminished and a considerable economy is effected. An American practice worthy of note is the grinding of a mixed feed: a portable grinding outfit with three grinders is used, and lucerne, maize, and (say) oat straw may be ground and bagged, mixed together in any desired proportions.

It remains to be seen whether the greater digestibility given by grinding is worth the expense when lucerne is to be given to cattle, but the meal appears to have a certain future.

ENSILAGE.

Like other leguminous plants—all of which are rich in protein, and lucerne particularly so—lucerne does not by itself make good silage. Well mixed with material poor in protein, such as straw or unthreshed corn of any kind, meadow grass, green maize, and the like, lucerne makes an excellent component of silage to which it supplies protein and minerals. Lucerne for silage should be cut as soon as it flowers and if grass is to be the other component of the silage, old grass is preferable to new short growths. These recommendations may appear contradictory, but are not so in reality. It is true both of legumes and of grasses that older plants contain more starch equivalent and less available protein per ton than young plants of the same kind: this fact is utilised in successional grazing and in other ways. Old lucerne is inclined to be stemmy, and even though it is less nitrogenous than young lucerne, it contains too much nitrogen to be a satisfactory silage material by itself; furthermore, the hard lucerne stems

¹ These figures presumably relate to the American (short) ton of 2,000 lb.

prevent the close packing which is essential in a silo. A poor stemmy grass on the other hand is a corrective for the unduly nitrogenous lucerne. Thus, while lucerne is at its best when grazed or soiled, it can be made into a first-class silage and thereby it enables the farmer to utilise grass too poor to be made into good hay. The lucerne mixture for ensilage requires no special precautions, treatment or type of silo, and it should be treated exactly as is the oat-vetch mixture which is commonly ensiled.

GENERAL CONCLUSION.

The purpose of this paper has been to place within reach of the progressive farmer information, as far as it is available and not radically contradictory, upon the growing and utilisation of lucerne. On some points—such as the effect of lucerne on a subsequent crop of sugar-beet—English practice does not seem to have been recorded and no information either practical or experimental respecting English conditions is available. In this case and in some others the authors have had to rely wholly or partly upon experiments made and records collected in other countries. Only those data have been selected which bear upon conditions likely to be encountered in this country in regions where lucerne can be grown with success. Thanks to the modern process of “inoculation,” the area in which lucerne can be grown now embraces the greater part of England and Wales and the southern parts of Scotland where climatic and soil conditions are favourable. An extension of lucerne cultivation in the West and Midland counties has already begun and should increase rapidly as soon as the great value of the crop begins to be appreciated. It must be emphasised, however, that, in these comparatively new areas, the conditions differ somewhat from those obtained in East Anglia and that there are a number of points upon which experiments are still needed in order to discover the best methods of growing and dealing with the crop in these districts.

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A FARMERS' LIVE STOCK MARKET. (MIDLAND MARTS LIMITED, BANBURY, OXON.)

IN the north of England and in Scotland live stock prices have for some years ruled consistently above prices in the Midlands and in South England, a fact which has called for singularly little comment from the agricultural community and from those who would seek to reorganise the marketing methods of the industry. The fact that the general quality of the northern stock is better has been generally accepted as sufficient reason for the discrepancy and little attempt has been made to examine the problem further, to discover why the farming standards themselves are so dissimilar. In various parts of the South sporadic attempts have been made, but with singularly little success, to establish farmers' bacon factories and slaughter-houses; many of these have now passed into private hands or remain derelict as monuments to the failure of piecemeal and provincial reorganisation. Meanwhile, the live stock auction market has received too little attention, or has been subjected to wholesale condemnation as an anachronism.

One of the most remarkable differences between the farming of the North and the South lies in the methods employed in live stock marketing. The regular weekly, fortnightly or monthly market for farm produce such as has prevailed in the South for many centuries was unknown or relatively rare in Scotland. There distances between towns were greater, the population was more sparse, and agriculture remained for a much longer period less commercialised and more self-sufficient than it did in the South. Periodic fairs in spring and autumn were the chief means available to the farmer for selling his finished product and for buying his raw materials and household necessities. To-day the regular auction market is of equal, or of greater importance than it is in Southern England; but in Scotland it grew mainly out of the efforts of individual auctioneers, and not, as in the South, out of the regular weekly private-treaty sales or markets—as a rule owned and jealously guarded by townships.

About the middle of the last century the first private auction mart was started (at Edinburgh in 1849) by a private firm of auctioneers. Since then many such markets have been established in different towns by private enterprise, by Joint Stock Companies, by Corporations and by Producers' Co-operative Organisations. The type of organisation controlling the market is, compared with the importance of a well-ordered market, of singularly little moment. What is of primary importance is that there should be a well-arranged sale yard in a

suitable locality where all the stock is sold through one agency to which therefore the biggest possible concourse of buyers and sellers may be attracted. Farmers learn far more by example than by any other means, and the constant object lesson of the large auction market has contributed enormously to the high standard of live stock production north of the border. Weekly public sales have meant that everyone knew the price and therefore probably the value of his neighbours' stock. Sales through a single agency meant that all the buyers were in continuous competition, and that large numbers were attracted by the large number of stock offered. The sale then became a weekly competitive live stock show where the prize was awarded by the buyers themselves and the certificate was the price realised. The spirit of competition was loosed with the inevitable results of improved quality. To-day Scotland holds an almost complete monopoly of the trade in the finest quality of beef, though there are in England as good breeds and farms, and farmers of equal technical ability. The debt that the Scottish farmer owes to the pioneer cattle auctioneers is perhaps not fully realised by himself and is certainly unappreciated by the southern farmer.

In England the history of marketing has been different. It is only recently that there has been any tendency to break away from mediaeval practice or any attempt to replace antiquated marketing methods; but the failure of the old system, from the producer's point of view, is now almost universally acknowledged. Multitudes of small markets, originally designed to meet local requirements of producer and consumer, have persisted in spite of the fact that they are redundant and damaging to the farmer's interest; rings have been unavoidable and prices have been artificially depressed by the very smallness of the market.

Of late, particularly since the War (when the Government took over much of the normal marketing machinery) there has been a distinct tendency for the smaller market to disappear. Weekly sales have in many cases become fortnightly or monthly, and many other instances could be quoted of the complete collapse of the small market. Transport has become cheaper and more efficient, and the better and more stable prices realised at the larger centres have encouraged centralised marketing. There are, however, certain important differences in the situation as it is now developing in England and the situation fifty years ago in Scotland. In England there are innumerable market charters, many of extreme antiquity, which give the township the right to exact tolls and to give the freedom of sale to any individual or agent. This has resulted in three major defects. Firstly, the town council has been responsible for building the

market—or for not building it—and so responsible for the design of the material services for which it exacts tolls. Town Councils and Corporations are almost necessarily indifferent judges of what the farmer requires, and are often more concerned in attracting trade to their own shop doors than in giving efficient service to the agricultural community. Secondly, it has been possible for any number of agents, auctioneers and private individuals, to conduct business concurrently at the market centre, with the result that frequently the volume of the trade is divided and much of the advantage of centralisation negated. For example, one of the largest markets in the Midland grazing area is split between four firms of auctioneers; each week four sales run concurrently and the natural competition among buyers is thereby considerably reduced. The market has become virtually four separate markets held concurrently and in competition one with another. On the other hand there is practically no limit to the number of cattle which can be handled by one agency in one day by subdividing stock sales into various classes. The third defect is that, under a Charter, a monopoly is conferred on the Corporation, whereby any other trading which amounts to a market becomes illegal, and farmers cannot easily remedy the situation on their own initiative. Where no Charter exists, then a private market may be instituted, but even this can be prevented if it can be shown to be damaging to the rights conferred by any existing Charter in the immediate neighbourhood.

The problem of reorganisation is involved, and is one which cannot be settled summarily. There are those who would do away with all the existing machinery, substituting abattoirs for live stock markets and dead meat vans for cattle trucks on roads and railways; but the mind of the reformer is inclined to move more rapidly than the minds of those for whom he attempts to legislate. "Marketing Reorganisation"—an easy phrase—is too often suggested as the panacea for all the present ills of farming, and the low standard of production which prevails is too often, at the present day, completely ignored. A new system of marketing which does not raise, by individual effort, the standard of production, is of little use to the community as a whole and of no ultimate advantage to British agriculture.

THE MARKET IN THE MAKING.

The recent development of Banbury, in Oxfordshire, as a live stock marketing centre, provides an example of the difficulties which are met with in attempting any form of reorganisation. The failure or the success of the development may be

inferred from the story, the results, if not spectacular, are of much more than local interest, and already the details of a twelve-year struggle against, at times, apparently insurmountable difficulties, are being lost in the acceptance of success.

Banbury, situated in the north of Oxfordshire on the borders of Warwickshire, lies in a valley between the fertile red-land soils. It is an old town and has, for generations, been the centre of a prosperous agricultural district. To the north and to the east, at no very great distance, lie some of the best grazing districts in the country. To the south the arable land, once well known for its folded sheep and barley, still carries some of the most famous of the flocks of Oxford sheep. In the immediate neighbourhood, and to the west, dairying is an important industry, much of the milk being railed to London or handled by the local depot of the United Dairies in Banbury itself. The town of 12,000 inhabitants exists largely on the agricultural community, and there are no other towns sufficiently near to be in competition with it. In spite, however, of its isolation, it is important as a railway centre, being served by three of the main groups, G.W.R., L.N.E.R. (G.C. Section) and the L.M.S. (L.N.W.R. Section). For a town of its size the railway facilities are good, by good luck rather than by good management, for, in common with several other towns in the Midlands, it many years ago refused to allow the Great Western to place their works there, and actively opposed railways in general—much as it opposed the new market—as something strange and therefore presumably dangerous.

Banbury lies nearer to Birmingham than to London, and the bulk of trade is northwards, though the running of a Sunday sheep-train to the London Caledonian Monday market was, until recently, a regular weekly event. In the autumn there is a steady flow of store stock from the district eastwards into East Anglia. This is generally consigned to Norwich. Typically it is an exporting area, lying conveniently near the consuming centres, serving a very mixed agricultural district and well served by railways.

The town received a market charter in the reign of Henry II, and has for many centuries been the most important market centre of the district. For some obscure reason the Corporation lost, or forwent, the right to levy tolls, and the town market is toll free. This fact has had a considerable effect on the building of the new market. In 1924, before the new market had been built, the old street market presented an almost mediæval appearance. At one end of the town was the sheep market held in a temporary erection of wooden hurdles; half a mile away, on both sides of a now busy thoroughfare, was the cattle market. Here lots of cattle were held together by the

shouts and sticks of drovers whilst their owners walked up and down talking to likely customers. It was impossible to see individual animals, and a bull in a china shop was no myth—it was only a few years ago that the office of a solicitor was invaded by an angry and terrified cow. In another corner of the town a dozen or two of pigs and a few poultry were penned among a medley of sweet stalls, cheap jacks, colporteurs and vendors of uncertain cough cures. Remains of other, and probably similar, markets are now preserved only in the names of the streets, as, for example, "Horse Fair." To an outside observer the whole scene presented an indescribable confusion of motor-buses and carriers' carts, of ragged drovers eternally chasing terrified beasts, and of gentlemen in bowler hats and dung-stained mackintoshes calling loudly to their customers or observers with equal indifference. It was as mediæval in its picturesqueness as it was mediæval in its squalor and inefficiency.

The process of selling was even less organised. Two or three firms of auctioneers, every other week, would sell a few head of fat stock under the hammer, but the bulk of the live stock, store cattle, was sold weekly by private treaty, the price depending on the bargaining power of the buyer or on the amount already owing by him to the dealer. Free of tolls, the market was a liability to the town, to the extent, it was said, of some £700 per annum; but it was treasured as a source of revenue to the local tradesmen through the weekly custom which it brought to the shops and to the inns.

Soon after the War a plan was discussed of establishing a local farmers' slaughter-house in order to enable the direct sale of live stock produce on the dead meat market. High prices and the experience of control during, and directly after, the War had encouraged some of the more enlightened farmers to attempt to reorganise their methods of sale in this manner. They were not content to revert to the pre-war chaos. This scheme—which never reached maturity—was, wisely it must be said, replaced by a scheme to reorganise the existing methods of live stock marketing. The dead meat market, always extremely speculative, was, at that time, more than usually uncertain; indeed it is fortunate that the abattoir scheme was not undertaken, for a similar enterprise actually started some thirty-five miles to the south of Banbury ended in disastrous failure.

In 1919 the scheme for market reorganisation was discussed, and in 1924 a company was floated, starting business in 1925. Six years later the street market had disappeared, and now, in 1932, Midland Marts Limited has passed beyond its experimental stage, and is one of the most important collecting markets in the South Midlands as well as a centre for the

disposal of store stock to the feeder and the dairymen. Thirteen years.

Such, briefly, is the history, but what takes a sentence to describe was the result of the courage and tenacity of a few long-sighted reformers who overcame, step by step, the innumerable obstacles which they found, or which were placed, in their way. Before the company was formed the site was privately purchased. It was wise management which enabled the company at a later date to buy at a very small price a magnificent site adjacent to the two railway stations. Had the land purchase been delayed until the company was actually in being the land would have cost far more. Then local support had to be canvassed amongst the farming community. Those who wanted the slaughter-house had to be weaned from their scheme, others had to be converted to sale by auction, had to be persuaded that it would be possible to compete with, and eventually to replace the centuries-old street market. Bit by bit the support of the farming community was won. Then came a long drawn out conflict with the town. Opposition was met on all hands, and at times it almost seemed that the whole project would have to be abandoned. The town was against it because of the predicted damage to trade in general and to that of the licensed houses in particular, and the dealers were against it because of the restriction which it might mean to their private sales.

The refusal of the Corporation to erect the new saleyard themselves resulted in an enquiry by the Ministry of Health. The findings of this were that the proposed scheme would be an advantage to the Borough; that it would be well if the existing market were removed from the street; and that the site proposed by the syndicate was more suitable than an alternative site which the Corporation, realising the necessity of eventually building a saleyard of their own, had previously purchased. Subject to certain safeguards, the Ministry found that no one would suffer from the project sufficiently for it to be rejected, since the existing market was toll free. These safeguards were briefly that the Corporation should confer no monopoly on the syndicate; that they, the Corporation, should retain all their market rights; that an area of the new saleyard be reserved by the syndicate for private treaty sales; and, finally, that the Corporation should reserve the right to buy out the syndicate at the end of specified periods.

After the enquiry had been held, and the findings recorded, the opposition proposed to question the validity of the Ministry of Health findings, and again it seemed as though the case might have to be fought out in the courts. But wisdom prevailed and the opposition withdrew. It is scarcely neces-

sary to emphasise the fact that the findings of the Ministry referred only to Banbury and form no precedent. Conditions were unusual in that the new saleyard was not going to compete with the town's monopoly; rather was it going to save the town the inevitable expense of building at some later date a new market at its own cost. In the eyes of the Public Health authorities the old market had long been unsatisfactory and its security was by no means assured.

The Ministry of Health reported in June 1924; in October the deed of agreement was drawn up between the town and the syndicate; in November, the Company's prospectus was issued, the authorised capital being £50,000. The Company was floated on the allotment of the requisite share capital (£30,000), with an additional Treasury guarantee of £10,000, the acceptance of which enforced limitation of the annual dividend to 7 per cent. No debentures were issued. It may be regretted by some of the supporters of the co-operative movement that the company was founded on a Joint Stock basis. This was unavoidable in view of the amount of capital required, but it was intended, in the event of capital being over-subscribed, to limit each individual holding to a maximum of £200. This was not realised. However, over 50 per cent. of the capital is farmers' capital and it is understood that to-day no single holding of ordinary shares is greater than £2,000, while there are many holdings of £50 and under. In view of the peculiar position of the company with regard to the town, quite apart from any possible advantage to an individual or company, the risk of monopolistic control was, and is, non-existent.

In April 1925 the new saleyard was completed and opened for public sale. Since that time it has had a hard fight against heavy odds—falling prices for stock, continued local opposition, heavy financial losses and so forth. At times the position was precarious, and eventually the capital had to be written down. But the same tenacity of purpose which characterised its initial stages continued, and now, by hard work, Midland Marts Ltd. has attained a secure position. The street market made great struggles to compete, but first the pigs and sheep disappeared, and then the cattle. Now the street, which had been filled with live stock every Thursday morning almost ever since Banbury could be called a town, is filled with buses and cars. The prophecy of ruin to the town has not been fulfilled. The town, in fact, is richer by £500 per annum as a result of the rateable value of the new saleyard, to say nothing of the direct saving effected by the abolition of the old market or of the increased trade which has followed the new régime. The controversy which raged so fiercely and so long has ceased.

In the first four years of trading, 1925-1928, in spite of a very rapidly increasing turnover, losses were incurred. By 1928, however, the annual loss was under £800 instead of varying between £1,600 and £2,000, as it had done in the three previous years. In 1929 the company sought expert advice, and reorganised its finances. The process of reorganisation was complicated, but the main principles involved were the cutting down of the ordinary share capital by one-half, the issue of preference stock at 6 per cent., and, through the generous co-operation of one of the Joint Stock Banks, the writing off of nearly half the bank loan. This reorganisation had a remarkable success. In 1929, the company earned a profit of £2,888, and this has increased, in 1930 and 1931, to over £3,000 annually. In both these last years dividends of 5 per cent. have been paid on the ordinary shares. The turnover has increased year by year, and has now reached over half a million pounds.

THE MARKET IN BEING.

The layout and design of a market are of the utmost importance to its final success, almost as important as the site itself; and Midland Marts Ltd. is an excellent example of foresight and care in planning. The site is adjacent to the railway loading docks. Live stock can be unloaded, sold and reloaded without ever setting hoof on the road, a direct runway being provided from the docks to the pens away from all pedestrian and vehicular traffic. In addition to this there is another entrance for local stock coming in on hoof, as well as an entrance for private cars and a large car park. At the time the market was built the road transport of stock was not very important, and it is unfortunate, as recent developments have proved, that more unloading and loading accommodation for lorries was not provided. Already the open space for cars, which at first looked unnecessarily generous, is becoming congested with traffic.

Fat cattle, immediately on arrival, are put into pens so planned that the stock can be handled with the minimum delay. From their pens they are driven to the covered auction ring, each beast standing on the weighbridge whilst its predecessor is being sold. They are then driven out through an exit and are returned to their pens by another system of gangways. Fat sheep are sold in their pens, the auctioneer standing on a gangway between the two lines. Originally it was intended to sell all the sheep through another covered sale ring, but this proved impracticable with the heavy down breeds of the district, and, in spite of the crowd round the pens at the time of selling, it has been found more expeditious to move the buyers

than to move the sheep. The ring originally intended for sheep is now used for the sale of calves as well as for the sale of store sheep, for it is much more important for store than for fat sheep to be seen by buyers on the move and in bigger lots. Dairy cows are given covered lairage, in the centre of which stands a third covered ring for buyers. Pigs are also sold through a specially devised ring; there is also an unloading dock leading direct to the pens.

At the far end of the market is a building for the sale of eggs and butter with stands for live poultry, an addition not originally contemplated but started in 1927. Behind the fat cattle and fat sheep pens are others for store cattle and sheep, and, beyond again, pens set up under the agreement with the town for dealers' stock.

The needs of buyers and sellers have also been met by the building of a Grill Room and Bar. Any opposition which this might have occasioned on the part of interested parties in the town was dispelled by the formation of a committee of caterers who run the restaurant in rotation on market and sale days. Two of the five Joint Stock Banks have recently opened permanent offices in the market square, another proof of the growing importance of the business transacted. The company has acquired suitable grazing land, so that stock can be kept out of doors in summer before and after sale. It has also acquired an option on some adjacent land so that, in the event of its being necessary, the whole saleyard can be enlarged without prejudice to the general layout.

The ruling principle of the saleyard is that all stock shall pass through the auction and although a small amount of private sale of store cattle is conducted by the dealers in the pens rented by them (for £2 per pen per annum) all fat stock is sold under the hammer. The commission charges (there are no tolls in the saleyard) are as follows :

Fat cattle and sheep	4d. in the £	Pigs and calves	6d. in the £
Store cattle and sheep	3d. in the £	Poultry and eggs	5%
Horses	5%	Dead stock	5%

Tolls charged to dealers who do not utilise the auction are as follows :

Horses and bulls	1/6 per head	Dairy cows	1/- per head
Store cattle	6d. per head	Sheep	1½d. per head
Lambs	1d. per head		

No charge is made for stock unsold either by reason of not reaching its reserve price or through being bought in by the owner. That this latter custom still prevails is regrettable, but it is so deeply rooted in South England that, so far, it has been found impracticable to eradicate it. The practice has been widely condemned and has indeed failed to recommend it.

It is, however, less easy to overcome in the case of store stock than in that of fat stock, it being more difficult for a farmer in the former case to fix a satisfactory reserve.

In addition to commission, lairage charges are made when necessary, and the accommodation provided has proved of the greatest assistance in increasing the range of supplies. Much use is made of the facilities offered, both in regard to fat and store stock. The winter charge for housing cattle is 2s. per night per head, which charge includes litter, labour, hay and water; if cake is fed additional charges are made. In summer most cattle are held over on grassland at a cost of 2s. per week, and sheep at 1d. a night or 4d. a week.

At the present time regular weekly consignments are sent to Banbury from the following counties :

Oxfordshire	Berkshire	Warwickshire
Wiltshire	Northamptonshire	Dorset
Buckinghamshire	Sussex	Worcestershire
Surrey	Gloucestershire	Kent
Hampshire	Middlesex	

The extension of the collection radius has been remarkable, and alone forms sufficient proof of the facilities offered and of the prices secured. For a long time it was considered that the high transport costs of live stock must prevent any great extension of the radius, but the increase of prices which centralised marketing secures has more than compensated for the additional transport charges. To quote an instance. A regular consignment of stock (cows) reaches Banbury from Kent every Thursday from a customer who, only a few years ago, made a practice of buying his supplies from the Banbury area. Kent is very largely a cattle importing county, but the increase in relative prices, as a result of the operation of Midland Marts Ltd., has, at any rate in this instance, reversed the normal trade channels. There is no doubt that the advent of road live stock transport has reduced to a certain extent the cost of moving animals, but even so there can be little truth in the contention that rail rates are excessive.

The supplies to the saleyard vary in numbers and in origin throughout the year owing to variations in the demand and in the supplies of the farmers. Most of the supplies of fat stock are drawn from the grazing lands of Oxfordshire, Warwickshire, Northamptonshire and Buckinghamshire; consequently the largest numbers of stock under this category are recorded from August to December, when the east country markets are of the least importance. Store cattle and sheep, for which special sales are held in spring and autumn in addition to the regular weekly sales, are inevitably a seasonal trade. For these sales farmers' consignments reach the saleyard from

considerable distances, from Scotland, from the Welsh borders and from Ireland, and the stock is widely distributed over the feeding areas. Barren fat cows and fat bulls reach the saleyard regularly from a great radius, even, for example, from Kent, Dorset, and Gloucestershire. Criticisms have been levelled against the market to the effect that it is rapidly developing into a cow beef centre and has not had any influence in improving the quality of the better classes of meat. Whilst this is not altogether justified, there has been a marked increase in the supplies of the former. Banbury is not a natural centre for the best quality beef cattle. Firstly, it is situated in a typically mixed and dairy farming district, and secondly Rugby, only some thirty miles to the north, and Northampton to the east, are old-established markets for the produce of the South Midland grazing areas. But the trade in fat cows and fat bulls is of the utmost importance to the dairy farmer. Efforts have been made all over the country to encourage dairy farming, but little enough attention has been paid to the major by-product of the industry, the fat cow, which has been bought largely by the speculative dealer at unreasonably low prices. One of the greatest contributions which Banbury has made to the agricultural community is the provision of a collection point for cow beef, and, by the regularity of the trade, the insurance of a steady price. The market is well placed in relation to the Midland towns, where much meat of this quality is consumed.

In addition to the regular commercial markets pedigree stock sales are held at intervals, organised generally by the breed societies, and Midland Marts is becoming a recognised home of some of the important breeds, for example, the Aberdeen Angus. The central position and the ease of handling and transporting stock have been largely responsible for this.

Pig sales, although increasing, are disappointing compared with those of cattle and sheep. This can be largely accounted for by the fact that Banbury is not in a pig country. Apart from this, the whole organisation of pig marketing is very different from that of cattle, being of a much more local nature; but even so, the new market has not been without influence. One of the largest pig buyers in the country used to buy regularly through his commission agents in the old street market, in spite of the small number of pigs on offer; he has now found that, under the new conditions, prices have increased to such an extent that he can no longer afford to pay "Banbury prices." Attempts to hold pedigree pig sales have proved disappointing, but that can be probably attributed largely to the general depression in the pig industry. There is little likelihood of any spectacular increase in the importance of Banbury as a pig

centre until the national reorganisation scheme is brought into being. Horse sales, which were conducted from the beginning of the market until about three years ago, have now been discontinued. A new departure, however, was made in 1927 by conducting regular weekly sales of poultry and eggs. These sales have increased in a most remarkable manner, and the prices realised have, for the past year, ruled consistently above those prevailing at egg sales conducted elsewhere in the locality.

The following table of numbers¹ of live stock and eggs handled in 1924, 1925, 1928 and 1931 give an accurate impression of the development of the Midland Marts :

	Fat Cattle.	Fat Sheep.	Dairy Cows.	Store Cattle.	Calves.	Pigs.	Store Sheep.	Eggs.	Poultry.
1924	350	c.9,000	Nil	Nil	375	Negligible	Nil	Nil	Nil
1925	2,109	15,485	659	1,606	998	444	6,901	Nil	Started 1927
1928	11,209	45,416	1,876	2,380	2,741	6,831	10,692	77,497	8,516
1931	15,914	48,021	3,417	2,855	3,175	9,858	11,253	156,556	18,566

It will be noticed that the numbers of store stock, both sheep and cattle, have not increased nearly in the same proportion as the numbers of fat stock. The supply of store cattle is much more firmly fixed in the hands of dealers, whose services to farmers in this direction are often efficiently and economically carried out. Moreover it is far easier for the farmer to sell through a commission agent, such as the Midland Marts, than to buy through one ; the one can be done without personal inconvenience and the seller can be fully protected by fixing a reserve price ; the other demands the presence of the buyer, and so, whilst it is quite a simple matter for the Dorset farmer to sell his barren cow in Banbury, it may be impossible, on account of expense or of time, for him to buy his small lot of store sheep at the same place.

The bulk of the supplies of fat stock move northwards from Banbury, and may be roughly allocated as follows :

Sheffield	25%	Birmingham	70%
Rotherham	15%	Coventry	15%
Leicester	20%	Nottingham	5%
Local	10%	London	5%
	70%	Total	100%

The prices generally ruling make further speculation with the live fat stock impossible, and it is possible to say that, to all intents and purposes, no cattle sold for meat at Banbury ever go through another public market.

¹ These figures are net, i.e., actual sales, and are not comparable with the figures given in market reports for other market centres. See page 126 for gross figures.

There was a good deal of criticism at the beginning that the market was mainly a dealers' market, but the following table, showing the number and the class of vendors in the month of February in the three years 1926, 1927 and 1928, shows how the number of farmer vendors increased relatively to the number of dealers selling in the market. Since these figures were compiled the proportion of dealers has become even smaller and there is no justification for the suggestion that it is not a farmers' saleyard.

1926.	Total.	Farmers.	Dealers.
Feb. 4th . . .	85	76	9
11th . . .	144	134	10
18th . . .	96	86	10
25th . . .	121	109	12
Mar. 4th . . .	105	96	9
	551	501	50—9%
1927.			
Feb. 3rd . . .	138	128	10
10th . . .	151	139	12
17th . . .	160	145	15
24th . . .	206	191	15
Mar. 3rd . . .	190	178	12
	845	781	64—7½%
1928.			
Feb. 2nd . . .	299	287	12
9th . . .	238	226	12
16th . . .	285	271	14
23rd . . .	281	272	9
Mar. 1st . . .	299	287	12
	1,402	1,343	59—4·2%

CREDIT.

The supply of store cattle to the stock farmer is a problem intimately bound with the provision of credit, a problem of even more pressing importance at the present time of financial stringency than in the more spacious pre-war days. In England, the provision of credit is mainly undertaken by the dealers in store stock and by the auctioneers, though the latter are, as a rule, not inclined to give either such big or such long loans. It is difficult, or impossible, for financiers to safeguard themselves as in ordinary business, because there is generally speaking no satisfactory security on which the farmer can offer a lien. The Agricultural Credit Act (Part II) of 1928 was an attempt to adapt ordinary channels of credit supply to the peculiar conditions prevailing in the agricultural industry but,

for various technical reasons, the measure has met with little success. It is the seasonal requirements of feeders which present the biggest difficulty. The problem of long term credit secured on mortgage is an altogether different matter. In fact the farmer, despite constant assertions to the contrary, does secure large seasonal advances on the most slender security through the medium of dealers and merchants but the rate at which this credit is advanced is not disclosed. The farmer is much indebted to those connected with his industry who use their own business as a means of securing credit to pass on indirectly to him. At the same time the fact cannot be overlooked that the acceptance of accommodation does tie the farmer's hands and restrict his freedom. This is especially the case in the live stock industry where the capital employed per acre is much greater than in the case of arable farming, and where greater difficulties are experienced in giving adequate security. A farmer buys stock on credit from a dealer; he must pay the price the dealer asks and has to resell to the dealer again at the price offered. The weakness of the farmer's position is obvious.

Largely as a result of methods introduced by well-organised auctioneering concerns, what are termed "agistment" schemes are common in the North and in Scotland. The auctioneers, financed by the banks or by share capital, provide the farmer with live stock which is sold, when finished, through the market, the balance between the original store price and the final fat price being handed over to the farmer. The stock remains the property of the auctioneers, who pay a nominal sum weekly for grazing or for feeding. This principle has worked well in the North for nearly half a century; the farmer has benefited by buying stock in a large store market on his own judgment and by selling again under free market conditions; but a similar principle is unworkable in England owing to the Bill of Sales Act, which restricts the security of the individual or company capitalising the farmer.

In order to overcome this difficulty Midland Marts have introduced a scheme whereby stock is hired out to farmers under an agreement not dissimilar from the hire purchase schemes common amongst sellers of gramophones and motor-cars. Once an agreement has been entered into between the intending purchaser and the company, stock may be bought up to the agreed amount, the purchaser paying 15 per cent. deposit. The agreement stipulates that the stock must be sold within a definite period (from two to twelve months according to the class of stock and the requirements of the borrower). When handed over, the stock is carefully earmarked and is, as a further safeguard, periodically inspected. Under this

scheme the farmer is legally liable for any possible loss on resale, whether through neglect or a sudden fall in prices, as well as for loss by death. The selling of the stock without the consent of the company is illegal.

The procedure is for the intending borrower to make application to the company, giving the number and class of stock which he intends to purchase, together with some reliable reference from the borrower's bank or acquaintances. The privacy of the scheme is therefore assured. Should the stock be kept longer than intended, or permanently, no further liability is incurred beyond payment of capital and interest but if the stock is sold by arrangement through any agency other than Midland Marts the borrower is expected to pay half the commission on the sale. No compulsion is placed on the farmer to sell under unsatisfactory conditions. Stock can be withdrawn from any sale and be disposed of anywhere, provided all arrangements are made with regard to outstanding payments. Interest is charged at 6 per cent. on all money outstanding. The form of agreement has passed successfully through the test of bankruptcy proceedings.

This scheme has now been in operation for some years and has worked very well, the only loss to the company having been a single item of £20. By charging 6 per cent., there is sufficient margin over the rate charged by the bank to the company to cover the cost of the periodic inspection as well as to create a reserve fund. The normal term of the loans required is such that the turnover of the bank credit by the company can be increased considerably. Two additional advantages to the company are that its business can be, and has been, increased and also that doubtful customers can be transferred from the credit columns to the hire purchase scheme.

From the point of view of the lender—the bank—there is the advantage that it has an assurance that the monies provided are being utilised for productive purposes and not merely for the settlement of past debts. Moreover, the hire purchase of live stock, unlike that of gramophones, finances an appreciating asset. The problem of the seller having a large amount of second-hand goods thrown back on his hands owing to the inability of the purchaser to continue his instalments cannot arise because the stock are actually increasing in value during the period of the loan, or at any rate the risk of serious depreciation is small. To the borrower there is the advantage that he must face his liability at a definite period, thereby discovering accurately the cash profit or loss upon the transaction. Furthermore, owing to the privacy with which the scheme is worked, other channels of credit remain available and the borrower's farm can be adequately stocked.

CONCLUSIONS.

Only a few years ago Banbury was a market of very little more than local significance, selling under 1,000 head of fat cattle a year in public auction and perhaps 8,000 to 10,000 sheep. Prices were notoriously low, and the whole organisation was effete and inefficient. To-day, private enterprise emanating from within the agricultural industry has converted it into a stock market operating over a wide area. In 1930-31 (November-October) the total consignments to the market were :—

Cattle	.	.	.	.	.	35,875
Sheep	.	.	.	.	.	81,787
Pigs	.	.	.	.	.	11,377
Calves	.	.	.	.	.	3,761

All this stock passed publicly through auction. The figure for cattle includes nearly 5,000 dairy cows, whereas, until Midland Marts started to work, no cows at all were sold by auction in Banbury, the bulk of the trade being in the hands of private dealers operating outside the market. In the Ministry of Agriculture Report on Markets and Fairs for the Stock Markets of the Southern Midlands,¹ only one case is mentioned in which the numbers for cattle were in excess of the 1930-31 figure for Banbury. The returns for Northampton, which is the next largest market to Banbury with 34,865 cattle, include all stock consigned, whether for sale through public auction or by private treaty, whereas the Banbury figures do not include stock consigned to the dealers' pens. If this figure were included, the numbers for Banbury would be 5,000-7,000 greater. The sheep figures are higher than any market in the report quoted, Rugby coming next with 81,066. Pigs, however, do not compare favourably with many other markets.

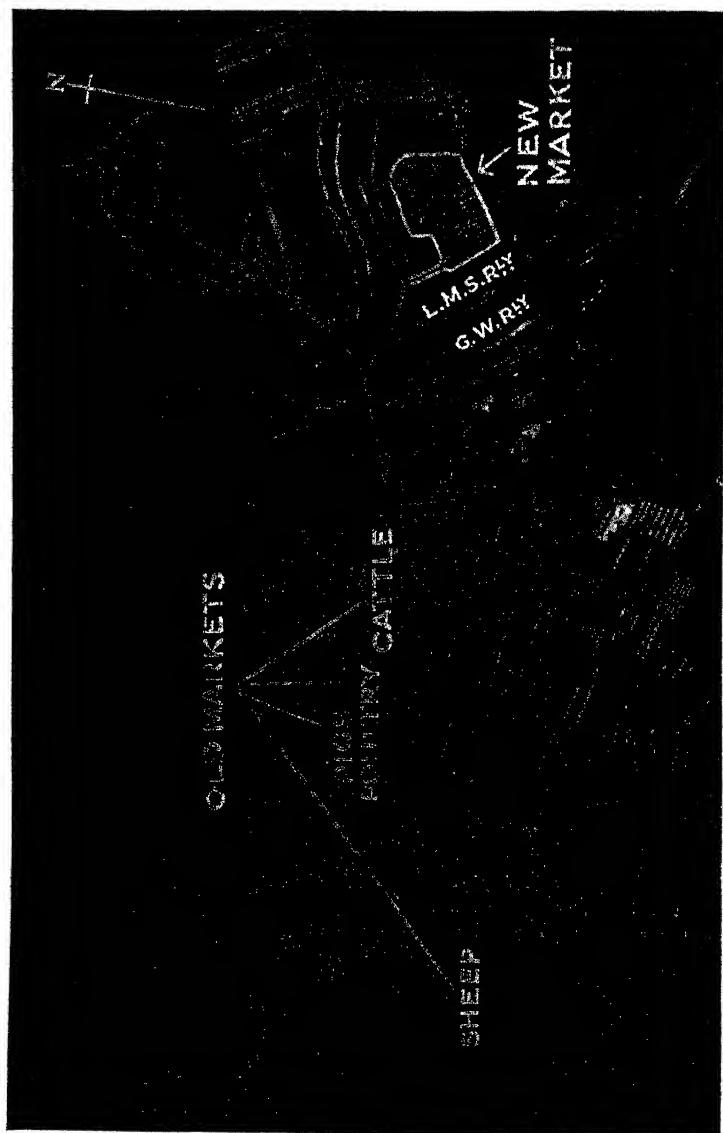
The figures which have been quoted for the other markets refer to 1926 and are therefore not directly comparable to the 1930-31 figure for Banbury. However, the greater prosperity of the agricultural industry in 1926 would, in all probability, mean that a direct comparison between the figures at the present day would show an even greater difference in favour of Banbury, which must now be one of the largest producers' stock markets in England. It has become the last and the only link in the chain of live stock selling between the producer and the wholesale meat market, between the stock raiser and the feeder or dairy farmer. The secret lies in the size, which creates competition and which prevents combination among buyers ; in the auction, which ensures publicity of sale and proof to the farmer

¹ Markets and Fairs—Economic Series No. 14, Ministry of Agriculture 1927. This report covers the following counties :—Beds., Cambs., Cheshire, Derby, Glouces., Hereford, Hants, Leics., Lincs., Mon., Northants, Notts., Oxon., Rutland, Salop, Staffs., Warwick and Worcs.

of reward for quality ; in the principle of a single sale, which prevents any division of the buyers' competition ; and in the efficiency of organisation which makes it possible to handle large numbers of stock at a minimum cost.

The principle of auction is of the utmost importance. Until more is known about price determination in the home-killed meat industry it provides the producer with the only adequate safeguard against unfair prices. Few farmers have sufficient knowledge of the value of their stock to afford to risk a sale by private treaty in spite of the satisfaction which the personal contact of such a sale often gives. Competitive sale combined with the fixing of a reserve price ensures the realisation of at least a reasonable bargain. Furthermore, a well-conducted weekly auction sale has a greater effect on the farming community than any number of live stock shows. As a means of exchanging store stock between breeder and feeder, auction selling provides the only means of valuing that most difficult to value of all agricultural commodities. Lastly, but by no means of least importance, is the necessity of an efficient organisation to handle stock so that they may be shown in the best condition to the best advantage. Site, layout, lairage, efficient droving, ease of loading and unloading are all problems which individually appear of minor importance but which contribute very largely to the success or to the failure of any reorganised market.

There are critics of live stock marketing who believe that centralised auctioneering is no longer an essential link in the marketing chain and who wish to see farmers selling on the dead meat basis through a system of abattoirs under public or semi-public control. There is scarcely any doubt that this will eventually be the means of transferring the produce of the meat producer to the consumer ; the final objective may be clear, but it is sometimes not easy to see the stages by which the objective is to be realised. At the present time there is practically no trade in rail-borne home-slaughtered meat. A regular trade in Scotch sides to London is an interesting exception, but this is a trade in a highly specialised commodity which has no direct competitors. Other classes of meat (particularly beef, which shows much more signs of travel damage than mutton) when slaughtered in producing areas and then carried to the consuming area dead-meat markets are always adversely affected by the journey. The carcasses themselves lose their bloom and the damage to the valuable offals is even more noticeable. Under conditions of a shortage of supply in any given market this damage may be insufficient to cause any considerable difference in price between fresh killed and transported meat but in times of adequate supplies there will be a noticeably



BANBURY.

By permission of the Air Ministry.

better demand for the fresher sides. A difference of one farthing per lb. in the price of the dressed carcass amounts to a difference of 13s. on an 11-cwt. bullock, exclusive of any difference in the value of the offals; a difference of $\frac{1}{2}$ d. per lb. means £1 6s. 0d. per head, which, to the farmer, represents an important difference in the price of his product. Moreover, should any dead-meat market be suddenly overstocked, the effect will be that the cheaper qualities of meat—the country-killed carcasses—will have to go into cold storage, which will cause a further depreciation in their value. Therefore, as long as the prejudice of the dead-meat trade is in favour of the freshly slaughtered carcass, the principles of “live meat marketing” will have to form part of the selling organisation if the English farmer is to secure the advantages of the maximum price for his home-produced commodity. At the present time any other system of selling will reduce the value of the farmer's produce to that of chilled meat from overseas. The problem is not insurmountable and there are obvious advantages to the community in reorganising the whole meat trade on a dead-meat basis, but what it is intended to demonstrate is that nothing short of national powers will make it possible for the agricultural community to reorganise on a system of abattoir selling.

Even so, to discuss the dead-meat problem is to discuss only one part of the whole problem of the marketing of live stock. Store stock is quite as important to both breeder and feeder as the finished products. This class of stock, constantly changing hands, is many months away from the abattoir and presents an entirely separate problem from that of the sale of fat cattle and sheep; at the same time, it is intimately bound up with the fat trade.

If the reorganisation of live stock marketing is to come by evolutionary methods, and not by any form of violent external control on the part of the organised consumer or the State, then the establishment of efficient live stock markets over the whole country is essential. Careful planning is absolutely necessary to prevent overlapping and also to ensure that, later on, the whole system of marketing may be turned over to the dead-meat principle. Abattoirs can be constructed in direct connection with the markets but little or no saving will be effected if the abattoirs themselves are so far removed from centres of consumption that a great amount of rehandling of the carcasses becomes necessary. Experience at Banbury has shown that live stock can, and will, travel considerable distances to a big collecting market and that, provided they are efficiently handled, no damage at all will result to the carcass. The old complaints about the bruising of stock, and even the complaints of the humanitarians about the cruelty inflicted, are without

justification in a well-ordered market. The farmer sells on a live weight basis; he is a producer of fat stock, not of dead meat. All that he needs is to ensure himself that the price he obtains is a truly competitive price and is comparable to the price at which the product, when processed by the butcher, is handed on to the consumer, due allowance being made for quality. He is not justified in usurping the butcher's function.

The functions of the live stock dealer have also been subjected to criticism, much of which is sound and justified. As a speculator in store stock his effects on the agricultural industry are largely disruptive. As a means of supplying credit he is unsatisfactory, though he is essential until replaced by other means; but as an agent for the collection and dispersal of stock he performs a function of the utmost importance. Such a scheme as Banbury does not in any way do away with the legitimate functions of the dealer, though the demise of the small and purely speculative dealer in the Banbury area is not the least remarkable effect of the new market. Already a considerable dealers' trade is springing up in the bulking and collection of stock from distant points for sale in Banbury. Farmers frequently consign small lots to dealers who make up truck loads for the market, charging their customers about 5s. per head for their services. The farmer saves himself considerable trouble, and often expense too, by this means, while the dealer is enabled to secure a reasonable profit for his work.

Midland Marts Limited, a farmers' company formed largely on farmers' capital, is an example, and, without question, a successful example, of the evolutionary organisation of stock marketing. It is only a stage in the development but, it is claimed, an essential and extremely valuable stage. The whole scheme was carried through against what frequently appeared to be impossible odds. It has achieved its immediate object though it has not yet reached its final development. The results justified the means. Events have proved the soundness of the judgment of the originators. But the days are past when even the replanning of live stock marketing can be thought of as a local problem.

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PIGS FOR PORK AND PIGS FOR BACON.

GENERAL CONSIDERATIONS.

WHETHER one should aim at producing pigs for pork, for bacon, or for both, is the first matter to be considered ; pigs which do not fill one or the other special purpose are a drug in the market. Unlike Denmark, where pigs are kept to produce bacon only, Great Britain has to supply both pork and bacon. Hence one of the questions which the British farmer has to consider is : Can both these products be produced from the same breed of pig—*i.e.*, are the requirements for pork and for bacon so different that a single breed cannot produce prime qualities of both ? This point, upon which opinions differ, will be discussed later ; in the writer's opinion, however, the best qualities of the two commodities are produced by essentially different types of pig. From general considerations it might appear that, of the two, pork is the product offering the better chances of profit ; the expenses connected with the preparation of bacon (factory and curing costs) must necessarily, if the product is to sell to the consumer at approximately the same price as fresh pork, lower the price paid to the producer. Moreover, cured bacon is more easily transported than fresh pork and hence is more open to competition with overseas products—unless, indeed (as seems probable at the time of writing) steps are taken to limit such competition. For precisely similar reasons the price given for manufacturing milk must necessarily be less than that commanded by milk for liquid consumption.

The demand for fresh pork (as it is at present produced) is, however, more limited than the demand for bacon. The estimated consumption of pig products in the United Kingdom (Ref. 1) is 11½ million cwt. of bacon and hams, as compared with 8 million cwt. of other pig products (including 3 million cwt. of lard) ; in other words the consumption of pork is less than half that of bacon. On the other hand, the pork side is estimated to be over two-thirds of the present home pig industry. Again the demand for pork in this country is seasonal (Ref. 2), being greater during winter (when there is an " R " in the month) than in summer. This, it may be noted, does not apply to other countries such as U.S.A. and Germany, where not only is the per capita consumption of pork greater but the seasonal demand is more uniform than in Britain. Possibly the reason for such differences lies in the fact that in these latter countries the packing house system and the methods of cutting ensure that only lean pork is sold to the consumer. If small lean pork could be put on the British market in bulk we should probably

find not only that the seasonal demand would become more uniform, but that the consumption per head of population would increase.

Since there is, at present, this seasonal demand for pork, bacon production offers an outlet for summer supplies of pigs and the existence of bacon factories acts as a steadying factor in the pig market. Unfortunately too many pork-type pigs, unsuited to give the best type of bacon, have been coming to our bacon factories. How we should proceed in order to produce both pork and bacon from the same lot of sows will be discussed below; the system suggested involves the use of dual purpose sows crossed with bacon- or pork-type boars according to the immediate object in view.

Whether in pork or bacon it is necessary that the public should get exactly what it requires. If the quality is not good then the demand for the product will decrease and the public will consume some other product in which the quality is high. Thus in countries (for example Germany) where the quality of the beef is poor, people consume less beef and much more pork and veal than we do. The raising of the quality of the product by better methods of production and marketing has, *e.g.*, with fruit and milk, greatly increased the demand for these products. Although the individual farmer may sometimes make for himself a little more profit by marketing pigs at heavier weights, and fatter, than the public requires, yet by so doing he is killing the possibilities for the future development of trade in his product. For similar reasons the consumption of English mutton and lamb has remained stationary during the last thirty years while the amount imported has increased by 50 per cent. (Ref. 3), most of the increase coming in the form of Canterbury lamb from New Zealand. With pork and bacon, as with apples and oranges and almost everything else, the consumer wants uniform size and quality. With pork in the United States this object is secured by a system of central packing houses where surplus fat is trimmed off and the carcass is cut to market requirements before sale to the retailer; the trimmings are worked up into processed meats and other products, the sale of which pays for the cost of the process. But such methods are not possible with our system of small local slaughter-houses. Under our system we have to do by breeding and feeding what the American does by trimming and processing. With bacon, indeed, little trimming is possible, and hence the production of uniform carcasses, by right breeding and feeding, is of more importance than it is with pork; it is in this respect that Denmark has excelled (Ref. 4).

PORK.

In order to get an exact idea of what the public wants we can study the prices that butchers are prepared to pay per stone for carcasses of different weights. Fig. 1,¹ which has been calculated from the auction sales of carcasses at the Smithfield Show in the years 1922-31 inclusive, shows the price (in pence per stone of 8 lb.) given for carcasses of different weights. No prize winners, or others for which fancy prices were given, are included. It will be seen from the figures that the prices are, more or less, average commercial prices for the years concerned. The highest price (98*d.* per stone) is given for carcasses of 60-70 lb., which corresponds to a live weight of 80-100 lb., and above this weight the price per stone falls rapidly till at 100 lb. carcass weight it is 86*d.*, at 150 lb. 74*d.*, and at 200 lb. 60*d.*

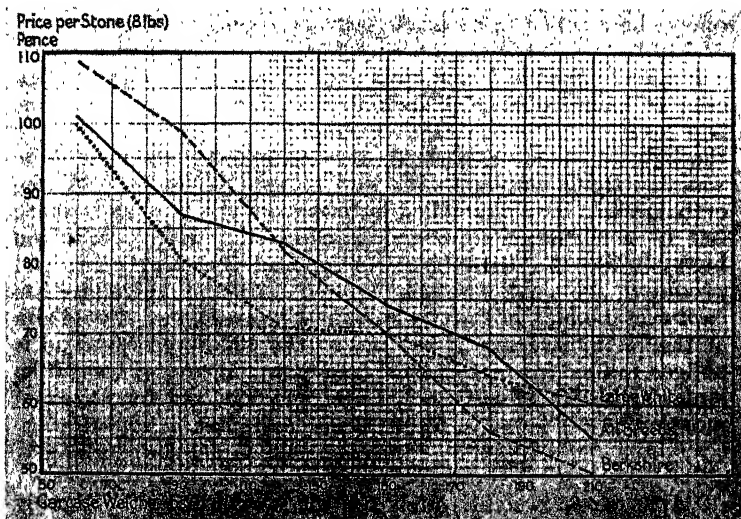


FIG. 1.—The Average prices (in pence) per stone (of 8 lb.) of pig carcasses of different weights. From Auctions of Smithfield Show carcass class pigs (Dec. 1922-31). The price falls rapidly as the carcass increases in weight. At the lower weights the carcasses of a pork breed, such as the Berkshires, because of their greater blockiness, command a higher price than those of a bacon breed such as the Large White. At the heavier weights, however, the carcasses of the pork breeds make less than those of the bacon breeds because of the extra fat which they put on at these weights.

¹ For this and other calculations of measurements of pig carcasses, too numerous and detailed to be published here, I am indebted to Mr. G. N. Murray, Dept. of Agriculture, Union of South Africa. It is hoped to publish these details in scientific form later, and only a few of the main general conclusions are referred to below.

The fall in price with increasing carcass weight is greater in years of low prices than it is in years of high prices; that is to say, in times of low prices there is more discrimination by the buyer against unsuitable carcasses. It may be said that the cost of production of these small carcasses is higher than that of the larger ones, and this is probably true; but it is not the reason why the butcher gives more for them. The reason he gives more is that he can sell them more easily and for more money. If we are to increase the demand for pork in England, we must produce more of these small carcasses and organise our methods of production to this end. This means keeping rather more sows and doing the young pigs better by careful feeding at and after the time of weaning. The inclusion in the diet of high protein feeds (such as milk products, meat meal, fish meal, and vegetable proteins) and of minerals is required for this purpose. Such a system of production is rather more costly than that of producing large pigs, but it offers the compensating advantages of a quicker turnover and, as has been pointed out above, of an expanding rather than a contracting market for the product. We have in recent years seen an example of this; before 1926 when the embargo was laid on fresh meat from the Continent, Holland was supplying the bulk of the small pork for London market, and this trade was rapidly increasing. The gap in supplies created by the embargo was for a time filled by pigs from the English farmer; but he persisted in supplying carcasses that were mainly too heavy while the Irish farmer organised the supply of, and produced, the small carcasses required. Ireland, therefore, has captured the bulk of the trade. The English farmer should aim at the 70-lb. carcass; if he aims at the 100-lb. carcass and is obliged to hold his pigs he will score many misfits, whereas if he aims at the 70-lb. carcass his pigs may be held for an extra month and still serve to fill up the second class.

QUALITY.

Apart from weight, quality must be considered. Having classed our carcasses first on a weight basis they will then fall into different grades, according to quality, within each weight class. Looking at Fig. 1 it will be seen that at the lower weights higher prices (as pork) are given for the pork type (Berkshire) than for the bacon type (Large White), but at the heavier weights the position is reversed and the bacon type makes a higher price (as pork) than the pork type. What does this high quality in pork mean? Apart from such factors as brightness and whiteness of skin, the things which mainly constitute quality are conformation—the relative proportions of the parts of the body (loin to head and neck, etc.)—and the proportions of the different tissues

(bone, muscle, and fat). These change considerably as the animal grows up as is shown in Fig. 2¹; in order to show these changes in proportions as distinct from changes in actual size, all the photographs have been reduced to the same height at the shoulder.

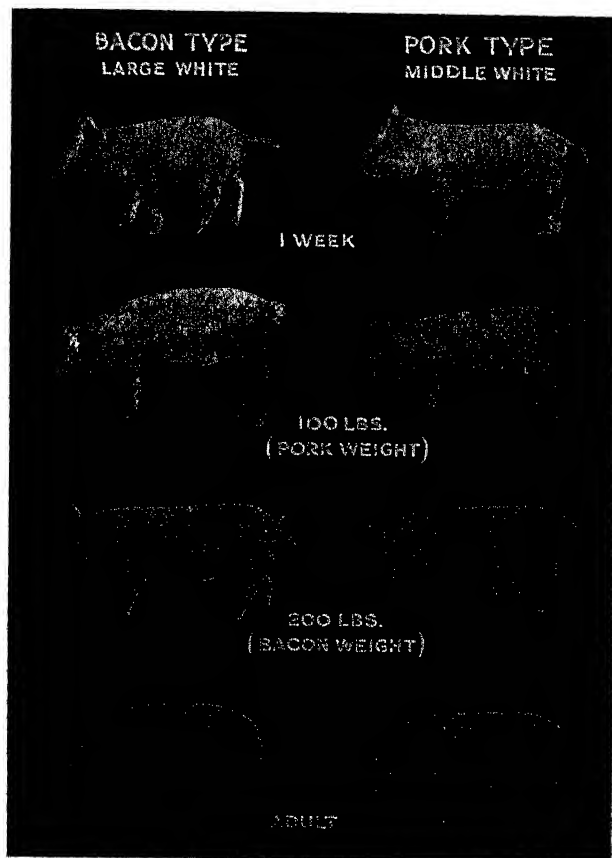


FIG. 2.—The changes in the proportions of the pig as it grows up. In order to compare changes in proportions as distinct from changes in size all the animals have been reduced to the same height at the shoulder. At one week the pig is all head, neck, and legs with a short and shallow body; as it grows up first its proportional length increases; then the body deepens and thickens so that the head, neck and legs become *proportionately* smaller. The pork breeds such as the Middle White go through these changes quicker than the bacon breeds such as the Large White; at pork weight (100 lb.) the bacon breed is still too leggy to make a porker, while at bacon weight (200 lb.) the pork breed has become much too thick and fat to produce good bacon. The body proportions of the pork breed at 100 lb. are much the same as those of the bacon breed at 200 lb.; these are the proportions the consumer wants. (Compare with Fig. 3, which shows how these changes in shape are brought about.)

¹ I am indebted to Messrs. Chivers and Sons of Histon for the facilities they gave me to photograph the animals shown in this figure.

At a week old the young pig is all head and legs with a proportionately short and shallow body; by the time a live weight of 100 lb. (pork weight) is reached the body has lengthened and the proportion of loin to head and neck has increased; later, when the pig reaches 200 lb. (bacon weight), the depth of body increases considerably, and this change continues to adult age. In the same way the proportions of the different tissues in the body change, as studies by weight in the sheep (Ref. 5), and by measurement in pigs (Ref. 6), have shown. For example, in the ham at one week old (see Fig. 2), the proportion of bone is large and there is only a thin layer of flesh, whereas at 100 lb. the muscle has filled out and the proportion of bone has become smaller; these changes proceed still further up to 200 lb., while at and after the latter weight the proportion of fat increases. These general changes in the proportions of the body as the animal grows up are brought about by the different parts and tissues growing at different rates; this can be represented diagrammatically as follows (Fig. 3):—

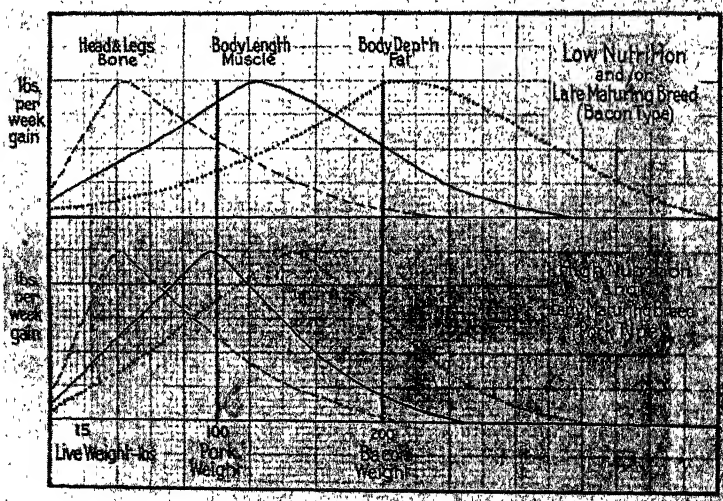


FIG. 3.—Diagrams showing how the changes in body form and composition are brought about by differences in the time and rate of growth of different parts and tissues of the body. The upper diagram shows how growth occurs in a late maturing breed (bacon type), or under conditions of a low plane of nutrition; while the lower diagram shows these changes in an early maturing breed, and under conditions of a high plane of nutrition. The curves represent growth of the parts of the body: (1) Head and legs, (2) Body length, and (3) Body depth—or alternatively of body tissues: (1) Bone, (2) Muscle, and (3) Fat. The thick vertical lines mark off the amount of growth made up to the time the animals have reached pork (100 lb.) or bacon (200 lb.) weight; this varies according as the breed is late or early maturing, and as the plane of nutrition is low or high (compare with Fig. 2).

These diagrams are only approximate and have been drawn from analogy with facts obtained from the sheep (Ref. 5); they

are intended to illustrate the principles rather than the details of growth.

The collection of actual details for the pig is needed before an exact account can be given of all the processes of growth and the concurrent changes in composition. As will be seen from the diagrams (Fig. 3) and photographs (Fig. 2), the different breeds of pigs go through these changes in proportions at different rates. In the early maturing breeds such as the Middle White the change in proportions is rapid, while in the later maturing types such as the Large White the *change in proportions* is slower although the *actual rate of live weight gain* may be higher. Herein lies the main difference between pork and bacon types of pigs. At 100 lb. live weight (pork weight) an early maturing type such as the Middle White has grown a good thick body with muscle in good proportion to bone; on the other hand at this weight the later maturing breeds such as the Large White have not yet reached the stage of body thickening and full muscular development, although they have made a lot of bone growth (see Figs. 2 and 3). By the time 200 lb. live weight (bacon weight) is reached, however, the early maturing Middle White has developed too much fat in proportion to lean muscle to make a saleable carcase; in the later maturing Large White, however, the muscles have now developed and the proportion of fat is about right. *The Proportions* of the body in the bacon type at 200 lb. are very similar to those of the pork type at 100 lb. The problem before the breeder of pigs is to get these body proportions right for the particular weight at which the animal is to be killed. This is illustrated by the price curve in Fig. 1; at the lower carcase weights the early maturing pork type (Berkshire) commands higher prices than the later maturing bacon type (Large White) which has not yet "filled out"; whereas when they are sold as pork at heavy weights the position is reversed and the later-maturing type (Large White) commands a higher price than the earlier-maturing type (Berkshire) owing to the too high proportion of fat in the latter. In a pork carcase great thickness of flesh, in proportion to length of bone, is necessary in order to supply what the consumer requires. Since length of bone develops early and thickness of muscle later it is only by getting the early maturing blocky (pork) type that this quality can be obtained in pigs of 100 lb. live weight (see Fig. 4).

Thus at 100 lb. live weight the early maturing pork type (Middle White) gives a much thicker cut of meat in the loin and correspondingly greater thickness of meat on the leg in proportion to the length of bone (see Fig. 4) than does the later maturing bacon type (Large White); it is mainly for this reason that the pork type has been evolved.

The various breeds of pigs may be placed in series according to the rate at which they change their proportions and, there-



FIG. 4.—Carcasses of bacon type (*Large White*) and pork type (*Middle White*) pigs at pork weight (100 lb.) and at bacon weight (200 lb.). Carcasses natural size all reduced by equal amounts. At pork weight the bacon type is too leggy, while at bacon weight the pork type is too short and fat to suit the consumer's taste; note that the proportions of the body, and of the tissues in it (fat to lean, and muscle to bone), are approximately the same in the pork type at 100 lb. as in the bacon type at 200 lb. live weight. The black lines shown on the lower carcasses indicate the places the measurements of bacon pigs (referred to in the text) are made.

fore, according to the weight at which they are fit to kill, *i.e.*, to yield carcasses with the right proportions of fat, muscle and bone. The tentative order (in the absence of complete knowledge of the actual weights of fat, muscle and bone at the different weights) would in the writer's opinion be something as follows:—

<i>Early Maturing</i> (suitable for killing at small weights)	Middle White	} <i>Pork.</i>
	Berkshire	
	Essex	
	Large Black	
	Long White Lop-eared	
<i>Late Maturing</i> (suitable for killing at heavy weights)	Wessex	} <i>Dual Purpose.</i>
	Gloucester Old Spot	
	Welsh	
	Large White	
	Tamworth	
		} <i>Bacon.</i>

Naturally, different strains within a breed vary in this respect, and it is by picking out such types as will kill with the right proportions of fat, muscle and bone at the weights required for pork or bacon, that slaughter and carcass tests (such as those at Smithfield and the Dairy Show) are aiding the work of breed improvement. To show how change can be brought about within a breed we may illustrate what has been achieved in the Poland-China breed in the United States during the course of a few years (see Fig. 5 from Anderson (Ref. 7)).

Up to 1912, when the demand for lard was good, an early maturing type of Poland-China, which developed a large proportion of fat, was bred; but as the demand for lard decreased, owing to competition with vegetable fats, breeders selected for a later maturing type which yielded a higher proportion of muscle and lower proportion of fat; this change was associated with actual increase in size of the animal. Eventually a breed which was formerly of the lard type was changed into one which is rather of bacon conformation. Thus the 1913 Model (see Fig. 5) was superseded successively by the 1915, 1917 and 1923 Models through judges favouring these respective types at Shows. Such changes in adult form are caused simply by a slowing down of those changes in form and proportions which take place with age (compare with Fig. 2).

The proportions of the animal can be shifted not only by breeding but also by feeding; if the breed is not quite right for the purpose intended it can be altered to a certain extent by the method of feeding adopted. For example, if it is desired to make the best bacon from a rather too early maturing type, the deposition of fat can be controlled by feeding to 200 lb. on a lower plane of nutrition than would be suitable for a



FIG. 5.—Photographs showing how the type may be changed within the breed. All the photographs (as in Fig. 2) have been reduced to the same shoulder height in order to show changes in proportions as distinct from size. As the demand for lard decreased, the type in the Poland-China breed has been changed in the direction of later maturity, i.e., with more bone and muscle growth and less fat. These successive changes are the reverse of the changes which occur as the pig grows up (compare with Fig. 2), i.e., the changes in its proportion as it grows up have gradually been slowed down. This has been attended with increase in actual size.

later maturing breed. It will be seen from Fig. 3 that, as the plane of nutrition is lowered, the formation of fat is inhibited more than that of muscle, and that of muscle more than that of bone. An illustration of how the proportions of the pig can be modified by feeding is shown in Fig. 6; this has been taken from some experiments by Henseler (Ref. 8), who by extremes of high and low feeding (beyond what would occur in farm practice) on different pigs of the same litter, produced at the same age animals of very different bodily proportions and composition.

One other means of getting the right proportions of fat to lean at the required weights (100 lb. for pork and 200 lb. for bacon)—even when the available sows are not quite suited for the particular purpose—is that of judicious crossing. Take, for example, Large Black sows. This breed is ordinarily a little too early maturing for bacon and at a weight of 200 lb. would ordinarily be too fat. When crossed, however, with a rather lean late-maturing Large White boar the sows should produce offspring which would, on ordinary feeding, mature at about the right weight. Again for pork (at 100 lb.) the cross of the Berkshire boar on Middle White sows is one which produces good results.

DUAL PURPOSE.

Whether a dual purpose (pork-bacon) type of pig (see p. 139 above) should play any part in our system of production is an open question. If so then breeds of this class should be used mainly to supply sows for a planned system of cross-breeding rather than for the direct production of either product. An exception might possibly be made where a careful feeding system, as described above, was used. For example, a farmer with dual

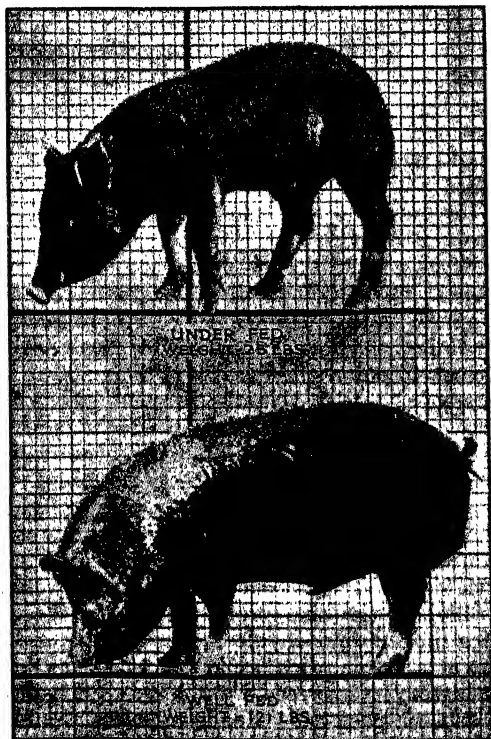


FIG. 8.—Photographs showing how the proportions of the pig can be altered by feeding on different planes of nutrition. The photographs are reduced to the same height at the shoulder in order to show changes in proportions as distinct from those in size. By feeding on a very low plane of nutrition the changes in the proportions of the body that normally occur with age are inhibited; the body is short and the proportions of head, neck and legs are high as compared with those of the animal reared on a high plane of nutrition (compare the proportions with those shown in Fig. 2).

purpose Large Black sows could take litters by a Large White boar to make baconers for summer slaughter and others by a Middle White boar to be killed during the winter for pork, thus getting both bacon and pork pigs from the same sows at

different seasons. Another method by which the same result could be achieved would be by devising a system of cross-breeding such as has been used with sheep. A cross between pork and bacon breeds (such as the Middle White–Large White cross, which has been much in evidence at Shows lately) produces a dual purpose type, and sows so bred have the merits of hardiness, high fertility and abundant milk that are associated with cross-bred vigour. Pedigree breeders might use their second grade sows for the production of such crosses and organise the sale of cross-bred gilts to commercial pig keepers. The system would be exactly parallel to that used for the production of Border Leicester x Cheviot ewes. In this way the pedigree breeder would do much to encourage the commercial farmer to use better stock and to buy pedigree boars for making the appropriate cross for pork or bacon production as the case might be. Such methods should enable us to get round the difficulty of meeting, at short notice and with only one type of sow, the fluctuating demands of the pork and bacon markets.

BACON.

For bacon a pig of 200 lb. live weight is required. If it weighs very much more it will usually carry too much fat, and if it weighs much less the actual thickness of flank and streak will not be sufficient to cut a good rasher. This 200-lb. pig should yield a carcase of about 156 lb. or 78 per cent. of the live weight; a higher carcase percentage at this live weight is usually a sign that the pig is too fat, i.e., that it has passed the stage of correct proportion of fat to lean. If, on the other hand, the carcase percentage is much lower (as is usual in pigs of lighter weight) the proportion of bone will be too high and the muscle will not be thick enough in proportion to the size of bone. The 200-lb. pig should yield two sides of cured bacon each weighing about 56–60 lb., which is the size preferred by the London trade. Heavier sides indeed find a sale in the North and in mining districts, but at a lower price, and looking to the future in the light of past history, we foresee a much reduced demand for this heavy type as time goes on. Hence breeders would do well to begin now to breed for the 200-lb. type. At this weight the pig should be fairly long—at least 30 inches from the first rib to the head of the femur or thigh bone (see black lines in Fig. 4); a pig of standard weight that is much shorter than this will usually show an overdevelopment of body and too high a proportion of fat to lean (see Fig. 4). It has often been said that a bacon pig should be long because length is associated with a high proportion of weight in the middle and a correspondingly low proportion in the fore-end and gammon; but (as will be seen from the photographs in Fig. 2) the proportion of middle to

fore-end and gammon rises continuously from birth and proceeds faster and further in the early maturing pork type than in the bacon type. Recent investigations by Brandt (Ref. 9) on American types of pigs have shown that the short blocky type cuts a higher proportion of " middles " than the long bacon type. The length desired in a bacon pig is, however, related to the proportion of lean to fat in the body when a live weight of 200 lb. is reached ; body proportions are more or less automatically regulated by fixing length and weight in the manner outlined in Figs. 2 and 3. Only a thin layer of back fat is required—a maximum of 2 inches over the shoulder, tapering gradually, without irregularities, from shoulder to loin (see black lines Fig. 4). If the proper weight and length of carcass are obtained there will be much less difficulty in obtaining the right amount of fat than in a short carcass of the same weight, for the longer carcass will naturally be less early maturing and so contain less fat (see Figs. 2 and 3).

The belly from which the rasher of bacon (streak) is cut should be as thick as possible (at least $1\frac{1}{4}$ inches—see black lines, Fig. 4) without containing too high a proportion of fat. Bellies can be made thick by heavy fattening, but this adds too much fat to the back and other parts. It is usually in the later maturing breeds and strains (and those with too much length for their weight) that one finds the bellies rather on the thin side ; in breeds and strains of this sort a cross with a slightly more early maturing breed or strain will usually improve matters. It is said that a good straight underline in the live pig is associated with a thick belly and flank, while a sagging abdomen means a thin streak ; but no exact figures have been obtained on this point. It is also said that the thickness of the streak is improved by avoiding heavy feeding just before the animal is slaughtered. In the bacon as well as in the pork type light fore quarters and heavy hind quarters are required because it is the latter which provide the highest-priced cuts. Heavy shoulders are undesirable in any type of pig. " Seedy cut," which consists of black pigment specks in the udder, is the cause of much loss because either much of the belly must be removed or else the whole carcass has to be sold at a lower rate. " Seedy cut " is only found in pigs with coloured skins, for the udder develops as a down-growth from the skin and brings the skin pigment in with it. Naturally less " seedy cut " is found in hogs and early-spayed gilts than in open gilts, because the udder does not develop so much in the former. Since white is " dominant " to black in inheritance, a cross with a pure-bred boar of a white breed will give (whatever the colour of the dam) offspring with mainly white skin and hair, and so with little chance of having " seedy cut."

METHODS OF IMPROVEMENT.

Various means are used for improving our pig production in order to meet the requirements of the pork and bacon markets. In this country the *Live Stock Show* has constituted the chief of these; the breed judges have largely controlled type by awarding prizes at Shows to animals of certain conformation. It is very important that breed judges should be thoroughly acquainted with the commercial requirements that their breed sets out to fill. Although the Live Stock Show system exercises a great influence on the type of pig produced by commercial farmers through the use by them of pedigree animals, this influence takes a long time to get through, and more direct methods are required to supplement the Show System. Under the Danish system of *Litter Testing* (Ref. 4) four pigs from a litter are sent at weaning time to a testing station. There the amount of food which the pigs consume, up till the time they reach bacon weight (200 lb.), is determined; the carcass is then graded at the factory and a complete report sent to the owner; and the latter makes his selection of boars and sows for breeding purposes on this basis. This system again is mainly applicable to pedigree animals because the expense involved would make it prohibitive for commercial pig producers. Moreover it is suitable only for bacon pigs because the movement and change of food would seriously interfere with the progress of small porkers. It aims at improvement by breeding only, and does not help the farmer towards improvements in his feeding or management. An alternative scheme of "*Pig Recording*" (Ref. 10) would probably suit the commercial farmer better and would be less expensive to run in proportion to the number of pigs dealt with. Under this scheme the size of litter, the weight and number of young at weaning, and the time taken to reach pork (100 lb.) or bacon (200 lb.) weight are recorded and after slaughter a report on the carcass is sent to the owner. Just as Milk Recording has helped to improve dairy cattle by breeding and has also led to more efficient feeding and management, so Pig Recording would be a means of doing all these things for pigs. Improvements in breeding must go hand in hand with improvements in feeding and management. If Pig Recording Societies were instituted they would link up the interests of commercial pig producers just as Milk Recording Societies have done for milk producers. The regular weighing of pigs would ensure their despatch to market at the right weights and so would tend towards that uniformity of size which is so necessary in modern marketing. Such Societies would, therefore, do for pigs what egg- and apple-grading centres are doing for these products. As the quality of milk is tested so would be the grade of quality of the

carcasses; and wherever the quality fell below first grade the owner would be informed of the reasons, so that he might take the appropriate steps, either in breeding, feeding or management as the case might be, to put the matter right in the future. These tests would do for the commercial pig keeper what the various carcase tests of pork and bacon (such as those at Smithfield, the Dairy Show and those organised by the National Pig Breeders' Association) are doing for the pedigree breeders. Carcase tests are a very important means of directing improvements in both breeding and feeding. Such tests are also of special importance in locating those boars which are breeding good stock. As with dairy cattle, it is important to know which sires are producing good stock in order that they may be kept as long as possible and their progeny used as breeding stock for the future.

The formation of Pig Recording Societies would do more than any other thing (apart from the all important matter of prices) to improve pig production throughout the country. The reports of such Societies would show who among their members were getting the best results and would, as with Milk Recording Societies, enable the individual to judge, on a comparative basis, the efficiency of his own methods. They would also show him where to look for better methods or better pigs. In fact Pig Recording would add that sporting interest of competition in production which does a great deal more than either preaching or the imposition of regulations to get a progressive spirit infused into industry.

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NOTABLE FARMING ENTERPRISES: III.

I.—MR. WEBSTER CORY'S FARMS.

At a time of acute agricultural depression, when even those sheet anchors of English farming, milk and sheep, are beginning to draw, the discovery of any successful farming enterprise is of more than local interest. More particularly is this so when the enterprise does not involve any particular dependence either on the material or on the economic advantages of the farm itself. The success or the failure of any business undertaking must depend primarily on the initiative and ability of the organiser to adjust himself to his environment and to the changing conditions of markets, particularly at a time when he is faced with unstable economic conditions, but, whilst it may be impossible for many to originate new and improved systems of husbandry, it is open to anyone to adopt the successful practices of his more far-seeing neighbours.

Not infrequently the success of a particular farm, or indeed the failure too, depends largely on certain factors which are peculiar to the farm in question, which cannot be made to apply to other individuals or to other units, and which are therefore of unique or of limited application. This, however, cannot be said of the farms now being run by Mr. Webster Cory, at Notgrove, on the thin limestone of the Cotswold Hills. There are thousands of acres of similar land, much of it in hand owing to the absence of tenants, and most of it being farmed at a dead loss, or, at best, but a niggardly profit. Moreover, the system on which Mr. Cory is now farming the land, although depending for its absolute success on his very great organising ability, does not depend on special marketing facilities or the like; in fact, with all due regard to Mr. Cory's skill, there seems little to stand in the way of imitators, given men of sufficient imitative capacity, with adequate capital reserves. To the originator of the system belongs all the credit, however simple the system of farming itself may appear.

The complex systems of the last century are too inflexible to suit present-day conditions, and the interdependence of the various departments of the farm, so valuable fifty years ago, is now a severe handicap. The circle of corn depending on live stock, of live stock on roots, and of roots on arable land, is too apt to become a vicious circle of continued and increasing financial losses. Any form of quick or of reliable departmental costings is impossible under such conditions, which alone should be sufficient reason for the failure of the system at a time when it is no longer possible to produce first and to consider selling price subsequently. The most essential feature of the farm

organisation to be described is the complete independence of each department of the farm. Each department is almost entirely a separate productive unit, capable of expansion or contraction at the shortest notice and without disorganising the capital of the other units—capable, moreover, of being very quickly and accurately cost-accounted so that its value to the farm as a whole can be assessed and constantly checked.

The Manor Farm, Notgrove, 13 miles north-east of Cheltenham, lies on some of the better land in the Cotswolds at an elevation of about 700–800 feet. When Mr. Webster Cory first took over the farm in 1916 the whole district was typically arable—sheep and corn farming with only small areas of grassland. At the present time much of the land has gone down, or has tumbled down, to grass, although a considerable amount of arable still remains; arable sheep have virtually disappeared, leaving behind them poorer and poorer crops on a soil frequently too thin and too liable to burn to make it possible to farm successfully without additional humus. At first the Manor Farm was farmed mainly on customary lines and during the war a certain amount of grassland was actually ploughed up. Even then tractors were used to replace horses, and later mechanical dung spreaders were employed to reduce the costs and to increase the control of dunging the land. These dung spreaders, some of the first to be used in England, still remain on the farm, proving themselves invaluable for the spreading of poultry and pig manure, but otherwise they are pensioned off under the present system. Usually costly machines to buy, several were bought in this instance very cheaply owing to the extreme prejudice at that time of the English farmer against these machines.

Changing conditions during the post-war slump made it necessary to modify the system of farming. Land was systematically laid down to grass, grass sheep replaced folded sheep, and dairying was introduced. This latter innovation was at first conducted on a system of part grass, part arable dairying, with fodder crops and silage replacing the root break of the arable sheep. Previous to the introduction of the dairy, a change of ownership of the land had brought Mr. Webster Cory into partnership with his present enterprising landlord, new buildings had been erected for the dairies, fences began gradually to be put into good order all over the farm and the fields to be supplied with water. The most far-reaching of what we might term landlords' improvements, have undoubtedly been this putting in order of fences and the carrying of adequate supplies of water to the fields. This allowed Mr. Webster Cory to turn a large and typical arable Cotswold farm into a productive grass farm, carrying a large head of stock. This is probably why the existing rent has been able to be maintained. The small turn-

over and the poor results of the older system of tillage and stocking made it clear that something had to be done and further modifications of the system were essential. Gradually more and more land was laid down to grass and now, of the 1,066 acres which Mr. Webster Cory has under his control, only 30 remain arable, and even these two remaining fields are shortly to be laid down. The dairy buildings have been very economically and suitably adapted for a pig unit; the dairies, greatly enlarged, have been converted to open air herds on the now well-known Hosier principle, and poultry have been introduced as a new and highly specialised department.

This brief outline of the development of the farm in the sixteen years of its life has been given in order to show how changing conditions have been met by many modifications in the system of farming. Sweeping changes and (Mr. Webster Cory would add) many mistakes have been made in the process; but at last, out of these years of great agricultural changes, has emerged the present system and although the history of the farm is of itself of great interest its present success is of more immediate importance. 1,066 acres of poor land rented at 15s. per acre, of which 800 acres is scheduled as arable, is, in spite of the excellent condition of the fences and of the water supply, a problem which not many would care to undertake, and which few, if any, could solve as successfully as Mr. Webster Cory has done.

The farm is divided into four departments, dairying, grass sheep for fat lamb production, pigs for bacon, and poultry for egg production. Each of these departments is an entirely separate unit. Even the interchange of labour between the sections is reduced to the absolute minimum, though there is no cast-iron principle which prevents a certain amount of flexibility in the organisation.

The centre of the farm, in fact and in theory, is the store house, the carpenter's shop and the machine shop, and to these is attached the utmost importance; to use Mr. Webster Cory's own phrase, "they are the heart-beat of the whole organisation." The store house, a perfect example of ordered system, is divided into sections, on the top floor, for all the different foods and meals which are bought. Here, as soon as a consignment arrives, it is immediately deposited by the consigner's men in its appropriate place and the sacks, when empty, are also placed under the owner's name, avoiding all confusion with regard to returned empties. Each week a detailed ration sheet, prepared in the farm office, is posted for all classes of livestock. The rations are mixed in bulk and placed ready for use on the lower floor under the name of the stock for which they are intended. Thence they are fetched by the stockman concerned. A weekly

food sheet on the ground floor shows to what supplies he is entitled, and each time a load is taken away the quantity removed is marked up by the stockman until his week's allowance has been drawn. The system is automatic and exact. The mixing of rations, rather than the purchase of already balanced foods, makes it possible to buy the raw material in bulk in the cheapest market, and, by avoiding the employment of a regular storekeeper, labour which would be otherwise unproductive can be usefully employed in this department of the farm. An additional weekly check on the foods used is kept in the farm office by balancing the invoices and disposal sheets. The great advantage claimed for this system is that there is no confusion, and that each man who is responsible for feeding knows exactly how much food he is allowed and can fetch it at any time himself. The carpenter's shop maintains at the present time a carpenter who is mainly engaged on the construction of poultry houses, but who also does necessary farm repairs. The machine shop keeps in running repair three Fordson tractors as well as the four milking machine engines (an extra one is held in constant reserve), stationary engines and hay sweep cars and is also responsible for maintaining the estate water and electricity supply. The efficient organisation of the centre of the farm, too often neglected, assists very materially in the reduction of overhead costs.

The dairy herd of about 200 cows is divided into three units, each one equipped with a portable Hosier bail, and with a horse and float. Two men do all the work required for each unit. One unit consists of Ayrshires, another of Irish Shorthorns, and the third of a mixture of the two breeds. Owing to the severity of the winter and to the system of open-air milking, constitution in the animals is of as great importance as high milk yields. The whole herd produces about 90,000 gallons of milk a year, giving an average of about 450-500 gallons per cow. The herd management is reduced to the simplest form; no rearing of stock is practised on the farm, all the dairy stock being purchased as down-calving heifers. Until recently Aberdeen Angus bulls were used and the cross-bred calves sold privately at about a week old. All calving takes place in the open. A change in this procedure has now been made with the Ayrshire unit, namely the using of a White Cumberland Shorthorn bull, and so successful is this cross that the rearing of heifer calves is being contemplated. Dry cattle are generally sent away from the bails and remain on other pastures until they calve. No attention is given to them except a daily observation, though in winter hay and cake are fed to them. As soon as the cows have calved they are drafted into whichever unit stands in need of replenishment; hence the need of one mixed breed unit; but, in

future, a modification may be introduced by which each unit will have its own constant herd.

The daily routine is for the two milkers to drive out to the bail (their horses are stabled only during winter) to milk the herd and to drive back to the farm with the milk. On the return journey supplies of concentrated food are taken to the bail, which is moved practically every day with the exception of Sundays, or during hard winter frosts and excessively dry periods in summer. A tractor has to be employed for moving the outfit from field to field, but the horse does the necessary haulage in any one field. In summer-time the milkers are not so heavily worked, but it is only rarely that they are called away to do general work such as haymaking: casual labour is mainly responsible for this and similar operations. As far as possible the hayricks are built where they are needed for feeding and the cartage of hay to the herd is carried out by the milkers with their horse and special hay float. During summer-time each dairy unit is allotted three or four fields and is moved from one to another, alternating with a rest period and with the grass flock and the dry cattle as followers.

It has been found by experience that the leys laid down in recent years nearly always give much better milk yields than the old pastures; whether this arises from the mere fact that they are young seeds, or from the fact that they have been properly managed from the start, is so far undecided. The grassland has been laid down very carefully and, judged by some standards, rather expensively. Grass mixtures have seldom been sown except on clean land and good seedings have been used. Mr. Webster Cory is a great believer in the value of wild white clover and of the more simple mixtures which have been so strongly advocated of recent years.¹ Certainly, judging by results, his belief is well justified, for he has succeeded in making very strong hard-wearing pastures under what are generally supposed to be difficult conditions. It is fortunate that basic slag acts so well on the thin limestone soils and the dressings which have been given on a great part of the farm have produced results which have demonstrated clearly the cash value of the treatment in terms of increased gallons per acre. So far there is no sign of any new

¹ TYPE OF SEED MIXTURE EMPLOYED.

Cocksfoot	7-8 lb.
Timothy	2-4 lb.
Perennial Ryegrass	12-15 lb.
Rough Stalked Meadow Grass	2 lb.
Cowgrass	4 lb.
Wild White Clover	1 lb.
Trefoil	1-2 lb.
	About 30 lb. per acre.

pastures progressively deteriorating, rather is a general improvement observable as a result of the careful routine management. Practically all of the fields have been watered and existing walls and fences have all been put in good order, but small fields are not required on this extensive and large unit type of farming; thus, practically speaking, no new fencing has had to be done. During the winter the bails are moved to the least valuable pastures where poaching will do the minimum of harm and there they remain as long as possible until new grass is available in the spring. The actual position of the dairies in winter is dictated by the amount of hay available in the vicinity.

The hay crop is almost completely mechanised. Cutting is done by power take-off mowers—a new Swedish pattern which can cut exceedingly close to the ground having given excellent results. Haymaking is done by horse-drawn side-delivery rakes and by 12-foot horse rakes. A hay-stacker, worked by a 5-6 h.p. stationary engine, which has been employed for two years, is fed by two old cars of high horse-power, which were purchased very cheaply, fitted with light Hosier sweeps. Where necessary an additional Hosier sweep, on one of the Fordsons, is used. The usual gang for picking up the hay consists of 6 men—two sweep drivers, two stacker operators, and two rick-builders—who with this equipment can easily deal with 15-20 tons of hay in a good day. The ricks have recently not been fully thatched in, only capped or thatched on the weather side, though not infrequently they are left without any covering at all. Rick building with a stacker, once the art has been learnt, is a very satisfactory method. The centre of the stack can always be kept filled so that there is less likelihood of rain penetrating and doing severe damage. Hay represents the main source of supply of winter food but a certain amount of grass silage is made both in stacks and in tower silos, the amount varying with the season. There are on the farm two wooden tower silos which were built originally in connection with the fixed dairy and the cattle-yards, but promising results have also been obtained from stack silage which is likely to play a big part in the winter feeding of the cows in the future; the existing silos are not very conveniently placed for this purpose.

Mr. Webster Cory has always been a great believer in the value of silage as a means of storing summer grass for winter use and has experimented recently with a mowing machine and small grass elevator, by Walter Wilder & Sons, which will cut the grass and load it direct into carts when it is too short to be handled in any other way. The recently introduced A.I.V. Silage Process is also being watched with considerable interest. With regard to the making of silage from young grass more experience is needed regarding the effect on the pastures of

several cuttings during the season, for repeated cutting cannot be directly compared with consistent routine grazing. Altogether about 400 acres are stored for winter use as hay and silage.

There is no secret in the success of the dairy department of the farm. Low costs of production by mechanised milking and by using large units make that perfectly possible, but the carefully planned central organisation and the system of making each unit completely self-contained are very largely responsible for the reduction of overhead charges to the bare minimum. After all, on any farm which is at all scientifically organised direct labour, food and depreciation of stock ought not to be items of extreme variation in the final cost but overhead charges can, and in practice do, vary within surprisingly wide limits.

The pig department, just like the dairy, is a separate section for which one man is completely responsible. The herd consists of 30-35 Wessex sows and two Large White boars for the purpose of producing baconers of about eight score for the Midland markets. About 400 baconers are produced a year and a certain number of hylts is sometimes raised for sale and herd replacement. The housing of the pigs is one of the most interesting features of the farm and is an excellent concrete example of how Mr. Webster Cory has modified the farming system. The present pig unit is the old fixed dairy converted. At first sight it might seem extraordinarily wasteful to go to the expense of "scrapping" a magnificent dairy building. Many farmers continue an outworn system just because "the buildings are so suitable." The buildings have in this instance been admirably converted to the Scandinavian type of piggery by making concrete pens all down the old standings; the original feeding passage still serves its purpose and the high standings give the pigs an excellent bed well out of draughts. A covered yard attached has been converted to house sows with litters and weaners and the loose-boxes make excellent farrowing pens. The whole cost of converting a 50-cow dairy into a 250-pig unit was in the neighbourhood of £300, a cost which, it should be pointed out, was met out of current income. Relics of earlier experiments with open-air pigs remain about the farm, but now the system is to keep the fattening pigs under cover. During the summer sows and litters run out most of the time and off-lying sows are grazed all the year round.

The pigman is equipped with a horse, a cart and a specially-designed float. He drives down daily to the pig farm, picking up on his way food and supplies from the central store. Several different rations are mixed for the different age groups and categories of pigs, and the quantity required each week can be accurately calculated. The pig manure is used on the grassland, being dealt with by means of the mechanical dung-spreaders.

The sheep, a flock of 500–600 Cheviot, Mule and Half-bred ewes, are under the care of one shepherd, who, as in the case of the other departments, is also in possession of a horse and cart which he uses for carting hay and food to his flock when necessary. At lambing time additional labour is allocated to this department. Fat lambs are sold, through ordinary marketing channels, from the end of June until November. At the present time the breeding flock consists of about 200 Cheviots, 130 Half-breds and 230 Greyfaces; ewes and ewe-lambs are bought at the Scottish sales for replacement when necessary. The management of a grass flock is so well known that there is little to say about it; the principles of management on this farm are not remarkably different from that of any other well-organised flock, for the simple reason that on many farms the shepherd's work is frequently as specialised as it is in this instance; sheep usually are run, on the "Notgrove principle," as a distinct unit of the farm.

The fourth department of the farm, the poultry, is a recent addition and is only now in the process of development, but is being very rapidly expanded after having been carefully tested out for two years. Mr. Webster Cory, who is himself a great believer in specialisation, thinks that incubating and hatching constitute in themselves a specialised job, and he therefore buys all his stock as day-old chicks. The primary purpose of the poultry unit is egg production and, with this end in view, only sex-linked chicks are bought, mainly of the R.I.R.x Light Sussex cross. The flock consists of two units of about 1,000 and 1,500 birds each, but it has only recently been divided, and neither unit is working to full capacity. This will be somewhere about 1,600–2,000 head. A range of loose-boxes has been converted into a brooder house for the day-olds by a Cope and Cope boiler and hot-water installation. The success of last season's experiment has led to the extension of this system and now the capacity of the plant has been increased to deal with 1,400 chicks. Whilst the chicks are in the brooder house they are under the direct supervision of Mr. Webster Cory. As soon as the birds are about nine weeks old they are drafted out into moveable field pens, and finally they are allocated to a laying unit. Already plans are laid to raise annually over 3,000 chicks, and so to increase the poultry department. Elaborate precautions are taken against disease by continual disinfection of the premises and no one is allowed inside without a preliminary disinfecting of the boots.

The two field units are each worked by one man who has a pony and a float for fetching supplies, watering, and so forth. Two different systems of management are being employed—houses which hold 60 to 80 birds on the free range principle, and

portable "arks" (house and run holding 26). The last is the most recent development, and is proving very satisfactory. This system has the great advantage that the birds are isolated in very small groups so that the risks of spread of disease are very considerably reduced. Also it prevents the depredations of foxes so that the poultry can be run in fields near to coverts; furthermore, these pens can be moved daily across a field, and a much more even manuring of the turf is obtained. The poultry manure from the larger houses is collected and then spread over the pastures by the dung-spreaders. Once again everything is being done, down to the minutest detail, to reduce unnecessary labour and to evolve an efficient routine. A moveable field-hut for each unit acts as a temporary food and egg store; feeding is as far as possible done on the hopper principle, minimising attention. At the end of each day the eggs are collected and brought back to the egg store at the farm where they are washed and packed by a woman, and finally collected by the National Mark Egg-Packing Station at Cheltenham.

The whole units are moved slowly over the fields, possibly taking a year to cover a single field, after which time the field reverts to the normal routine management and new pasture is taken over by the poultry. In the case of the portable unit sheep are run with the poultry when necessary, but have been found unsatisfactory as partners with the open range unit owing to the disturbance caused to the laying flock. The effect of the moving poultry on the value of the herbage is remarkable, and under the new system of portables, which is being increased, the improvement of the grassland is much more thorough and complete.

Turning to the financial aspect of the farm, the recent balance-sheets show unusually satisfactory results; as proof of which, it is possible to state that income-tax has been paid on account of the years 1929-30 and 1930-31. Since the introduction of the new systems previously described no net loss has been experienced, in spite of the fact that values have had to be very considerably written down. In 1931-32, mainly owing to the phenomenal fall in stock prices, a very large sum was written off.

Very full accounts and records are kept in the farm office and each department is carefully costed. Moreover, in several departments a weekly costing of direct expenditure and receipts is carried out, giving a picture of what is happening; and any department can be costed up to date (without of course the final overheads) enabling the financial position to be known at any time. This enables Mr. Webster Cory to keep a very watchful eye on the progress of the departments almost week by week, without his having to wait for the completion of the

financial year to assess his departmental profits and losses. The weakness of so many cost accounts is that they take too long to complete and frequently the information that they provide is already out of date by the time it becomes available. Owing to the specialisation of the departments this principle of "accumulative costing" is made possible.

The capital of the farm amounts to practically £12 per acre, the annual wage bill (May 1931 to April 1932) to £1,960, and the total gross sales within the same period to £8,613, a figure which, it is hoped, will be considerably exceeded this year, in spite of falling prices, as a result of the growth of the poultry units. The output per £100 of labour costs, which include cash wages, rent allowances, and insurance contributions, was, therefore, over £400. This figure can be taken almost universally as the main indicator of the economic success of the farm. To quote a recent report from the Department of Agriculture at Cambridge¹ :—

"It is perhaps unnecessary to draw attention to the fact that the principal points in planning to secure maximum profit are connected with the relative *price* levels of products and requirements, although, in farming, other considerations must be taken into account. At the present time labour is not only the most expensive of farm requirements, but it is also the largest individual item of the farmer's outgoings. . . . For this reason the economy in the use of labour is of primary importance. But, on account of the inelasticity of wages, the only means open to the farmer of economising in this direction is to increase the efficiency with which he applies his labour forces; that is, to raise the money value of the output from every £1 spent on wages."

Unfortunately the figures which follow in the report refer to arable farms in the eastern counties and do not form a useful comparison; but comparing the productivity of Mr. Webster Cory's labour with various other big grass and dairy farms costed at Oxford, the figure of £409 per £100 of wages is quite remarkably high. The output in kind last year, May 1931–April 1932, amounted to 87,937 gallons of milk, 169 calves, 638 fat sheep, 106 fat pigs, 149,822 eggs, and 1,080 chickens. During the current year production will again be increased, and it is hoped to turn out, roughly, 400 baconers and to increase the egg output to 200,000 eggs. This increase will be accomplished with little additional labour cost.

Good wages are paid throughout the farm, and bonuses are paid at the present time on the output of milk, on the number of pigs weaned and sold, and so forth. Mr. Webster Cory definitely believes in giving the men a direct interest in results and, as pointed out, endeavours to do this by means of bonus on output. He is, however, not prepared to say that his present method

¹ *An Economic Survey of Agriculture in the Eastern Counties of England, 1931.* Farm Economics Branch, Report No. 19, Department of Agriculture, University of Cambridge.

of doing so cannot be improved; indeed he hopes to improve it as time goes on. An arrangement, which works well, is in operation whereby regular half-day holidays are given to the staff in rotation; also in certain cases an annual holiday of one week is given on full pay. It can be seen, therefore, that however carefully arranged the labour of the farm may be, it is not so inflexible as to make it impossible to grant leave to individuals. The well-being of the farm labour is as important a consideration as the efficient working of the machine.

It is impossible in the compass of a short article either to do full justice to the description of the farm or to give more than a brief outline of those things which appear to an outside observer to be the most original and important factors contributing to the success of the undertaking. The old-fashioned method of "mixed farming," so mixed that it is impossible to get any satisfactory costs of separate departments, so mixed indeed that one department frequently exists in order to cover the losses of another, has got to give way to greater specialisation. But, in the farm described the specialisation has been accomplished internally, the output of commodities remaining almost as varied as it was when the farm was first taken over. The essential difference between it and countless other farms producing milk, calves, baconers, hils, fat lambs, eggs, poultry, and so forth, is that in this case the farm is a carefully organised productive unit, whereas in far too many other instances, it is the unplanned conglomeration of sheep, cattle, pigs and poultry, growing more or less promiscuously on an area of soil. Labour, by far the highest individual charge on any farm, can be economised not only by equipping it with labour-saving machinery but quite as much by so organising it that it is always working productively. It would almost seem that the equipment employed on this farm is incidental to its success, of so much greater importance is the horse and float with which each man is equipped—typifying, as it does, the reduction of unnecessary haulage and the prevention of redundant processes. The success lies in the specialisation of the labour to its particular work—the principle of one man, one job which he begins, carries out, and finishes himself—and the accuracy and speed with which each section of the farm is costed. The secret of success lies in the organising ability of the man who conceived the idea and has carried it out, in his capacity for extreme detail and in his constant watchfulness for any new implement or principle which may make his labour and his land more productive.

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II.—MESSRS. S. E. AND J. F. ALLEY'S MECHANISED FARMING.

IT is characteristic of British Agriculture that whenever a particular section of the industry is confronted with special difficulties there arise men with the capacity to evolve methods which seek to overcome those difficulties. It is unnecessary to argue that depression of the worst possible kind has confronted the vast majority of arable farmers, and particularly those who, in the past, have been largely dependent for their farming income upon the sale of cereals. It is equally unnecessary to explain the reasons. The outstanding problem of the present time is how to maintain a semblance of profitable farming with wages and other costs at a figure which bears no relationship to the market value of the product. It is easy to suggest directions in which minor economies can be effected, but even the most skilful application of all that modern science can give to the cultivator of the soil fails to establish a sound economic basis. To this end a high standard of fertility and high crop yield are by themselves of little help; high farming as applied to cereal growing under existing conditions has not yielded the satisfaction which one normally expects of it.

The depression of recent years is unique in that it is world-wide. A revival of world trade together with the introduction of legislation designed to help the home farmer are both required in order that the existing difficulties may disappear and the industry recover. There is abundant evidence, however, that the optimism of many agriculturists has contributed to their own undoing. Especially is this true when they have acted on the view that things have a habit of righting themselves, and have adhered to old methods. The point cannot be too strongly emphasised that we must not take for granted that old systems will again justify themselves, and weight is given to this fact when it is realised that the majority of successful farmers to-day are men who have displayed considerable ability in adapting their farming to the changed circumstances which prevail.

Taking the view that arable farming costs have become prohibitive many progressive agriculturists have curtailed their arable farming activities by laying land down to grass. This has necessitated embarking upon dairy farming, grass sheep, poultry keeping and pigs; and up to a point success has been achieved. Others, however, have explored the possibilities of profitable cereal growing by the revolutionary method of substituting tractors for horses and the elimination of the greater part of the labour normally employed. It must be recognised at the outset that this is novel only so far as this country is concerned. In the Colonies and the United States of America mechanised farming has been practised for some years, largely because of the

high cost of labour combined with the low farm prices that their distance from world markets implies. The introduction of this system to this country was at one time held to be impracticable by reason of climatic differences, but here again it was only necessary that men of ideas and determination should apply themselves to the problems concerned. The consequence is that we have now a number of successful mechanised cereal growing farms.

Outstanding among the pioneers of mechanised farming in this country are Messrs. S. E. and J. F. Alley, both of whom are young men. Mr. S. E. Alley is the elder brother, and he originally intended following his father's profession of engineering. He was, however, advised against this course by his father, who suggested that agriculture held out rosy prospects for intelligent men. Two years were spent on an up-to-date holding in Worcestershire where mechanical power was freely employed for agricultural and market garden crops. During this period many ideas suggested themselves to him, and being mechanically minded and of an inventive turn, he was soon deeply interested in mechanised farming ideas generally. Mr. J. F. Alley, the younger brother, was persuaded to go to Cambridge, where he read for his degree in Agriculture. On the completion of his studies the two brothers decided upon a joint venture in the application to home conditions of Colonial methods of cereal growing.

It will not be questioned that considerable confidence was needed to embark on a farming policy untried in this country except on a very limited scale; but considerable thought was given to the matter and plans were carefully drawn out beforehand. This is quite typical of the outlook and training of the two brothers. A careful study of the problems involved suggested that wheat was the most stable-priced cereal and specialised wheat production was, therefore, decided upon. The next step was to find a suitable farm. Preliminary discussion made it obvious that a reasonably large acreage must be available, while it was considered essential that the fields should be sufficiently large and of suitable shape to allow the efficient employment of large-sized implements. A further condition to be satisfied was that the farm should be within a single ring fence so as to facilitate the removal of the large implements from one field to another without causing obstruction on roads. Many farms were inspected before the Messrs. Alley fixed their choice on Bluestone Farm, South Creake, near Fakenham, in Norfolk, which has proved to be almost ideal for their purpose.

Norfolk has an honourable association with the development of arable farming, and it is of more than ordinary interest that

Bluestone Farm is situated on the Townshend Estate, where the four-course rotation with the cultivation of turnips was first practised. Existing accounts of the productivity of the soil in the days before the introduction of the four-course rotation and turnip and clover culture indicate the remarkable increase in the productivity of Norfolk agriculture. Thus the following account of Norfolk agriculture which appeared in *The Times* on February 1st, 1830, makes this fact very clear.

"In the year 1776 Mr. Coke came into possession of the Holkham estate. At that period not a grain of wheat had ever been grown between Holkham and Lynn, under the impression that the soil was incapable of producing it; and ten thousand quarters were annually imported at the port of Wells for the consumption of the surrounding country, where little else but rye was then cultivated. In 1828 the exportation of wheat amounted to 50,000 quarters, while the home consumption was greatly increased by a richer and more numerous population—that of the parish of Holkham alone having risen between the two periods from 176 inhabitants to 1,100, which number is found scarcely sufficient to perform the labour required. The land in Mr. Coke's own hands consists of 4,000 acres. When he entered upon it he maintained only 800 sheep, with other stock. Half the land now feeds 3,500 sheep, with the same proportion of other stock; the other half has been planted, and is paying well. In the beginning there were three farm-yards on the 4,000 acres; there are now twenty on the 2,000, and more are required. This statement places the capability of the soil of the country in a striking point of view, supposing the whole island to be equally well cultivated in proportion to its fertility."

One cannot travel through Norfolk without appreciating the force of the remarks in the above account. The liberal distribution of cattle feeding yards is evidence of former years of general plenty and good farming, which are now, alas, things of the past. That this county should furnish the land to test out the newest development in English arable farming, which runs quite counter to the methods which established its former prosperity, is almost paradoxical.

Bluestone Farm extends to 1,113 acres, 950 acres being arable. The rental value is £900, which includes the shooting rights. The soil is a light loam, with a gravel subsoil. The drainage is naturally good, and there is a complete absence of under-drains or ditches. All the fields adjoin good roads, which circumstance has proved invaluable in making it possible to get supplies to the fields without difficulty under all conditions of weather. Moreover, the fields have an average area of about 50 acres, so that the local conditions are as nearly as possible perfect for successful mechanised farming. The history of this particular farm corresponds closely with that of many in the district. Previous to 1927 it had been tenanted by members of one family for over fifty years. In prosperous times it was considered a very desirable holding. The farm was taken over by the Messrs. Alley in September 1930, but in the

few years previous to that date it had deteriorated both in cropping capacity and cleanness. It was by no means a simple business to enter the farm with the sole object of practising mechanised farming. It can easily be understood that though the owners of land are often glad to be able to let arable farms at all in these days, they yet cannot afford to disregard the custom of the district. It is possible for example that any material deviation from the four-course rotation in a four-course district will adversely affect the value of a farm for the purposes of re-letting. This has been kept in mind in the case of Bluestone Farm, since it is a condition of the tenancy that the farm be left in the four-course rotation at the conclusion of the tenancy.

It is obvious that the four-course rotation and mechanised farming are not compatible. Under the traditional four-course system some forty agricultural labourers and thirty-two horses were necessary for working this holding. Since the primary object of mechanised farming is to cut down the expensive manual and horse labour, a rotation is followed which meets this demand. Up to the present a three-course rotation has been followed consisting of:—

Bare Fallow.

Cereal.

Cereal.

The bare fallow is an essential part of this farming system. Apart from its being necessary for maintaining the cleanliness of the ground, it provides the limited labour resources with occupation during the spring and summer. The continual stirring of the ground is found to be quite effective even in summers lacking the weather considered necessary for successful fallowing. It is a Norfolk custom to sow mustard on the fallows in preparation for wheat, and this practice is being followed at Bluestone Farm. It may be suggested that the rotation is not sound in practice since seedtime and harvest are crowded into the same period, especially if wheat is the only cereal grown. This, however, has not given rise to any actual difficulties, since the large-sized implements employed have been well able to cover the ground in the necessary time. Thus the harvest of 1932 extended from August 22nd to the end of September—a period of five or six weeks. Bad weather is not allowed to delay cutting in view of the fact that equipment exists for drying the grain. The varieties of wheat employed are Squarehead's Master and Little Joss. Little Joss has, however, shown signs of wanting to lodge on this land. The fertility of the soil is maintained at a satisfactory level by dressings of artificial fertilisers.

The labour force of this 1,000-acre unit consists of four regular men. One man acts as foreman-lorry-driver; there are two tractor drivers and one blacksmith. At harvest time extra labour is engaged. Thus a tractor and self-binder employing two men are used for opening out the fields. Two tractors and two combine harvesters employ four men. Grain collectors were fitted to these combines for the 1932 harvest and it was estimated that they saved eleven men. Day and night shifts are worked during harvest for the purpose of drying the grain and this work employs four men. The total number of labourers employed in the 1932 harvest was thirteen, though the Messrs. Alley themselves also were available to direct operations.

The mechanical equipment employed consists of three tractors—two "Caterpillar" and one Massey-Harris. It is considered essential that the tractors should develop at least 20 draw-bar horse power. The "Caterpillar" tractors have done the bulk of the work and have given every satisfaction. Each worked 3,000 hours in the first year and 2,500 hours in the second. At the commencement petrol was used as fuel, but increasing petrol prices have made it necessary to change over to paraffin, and no ill effects have been observed. The importance of fuel economy can be recognised from the fact that in 1931 over £800 was spent on petrol, paraffin and oil. At the moment trials are being made with a specially designed Diesel tractor which must be the biggest of its kind in this country. The machine is purely in the experimental stage, but in spite of the fact that it weighs about 6½ tons this weight is so well distributed that the pressure on the ground is no greater than that of many lighter machines. The driving wheels have a diameter of 5 feet 6 inches with a width of 2 feet. The wheel base is 7 feet 9 inches, while the lock is such that the tractor can be turned in a 30 feet circle. Every thought has been given to the comfort of the driver, who can sit in an enclosed cabin, while there is flood lighting for night work. The wheel pressure is 9.5 lb. per square inch, the fuel capacity amounts to 80 gallons, and the estimated consumption in harvest is about 1 gallon per hour, or 3 gallons per hour when on heavy work. The engine, which is self-starting, has been carefully designed so that frequent lubrication is unnecessary, running for 100 hours without changing the oil. The horse power of this machine is 70, and it is hoped to increase this still further. The cost of the tractor is estimated at about £1,200, but it is regarded as a sound proposition for this type of farming; its development will be watched with interest. If the use of such giant tractors should prove successful it may be necessary still further to revise our ideas of this type of farming. In theory, a tractor of this size should be able to draw two five-furrow

ploughs. The ploughing rate is 5 miles per hour and it is estimated that two shifts could keep the tractor going for 20 hours per day. It is interesting to speculate on the acreages which such figures imply. Such a machine, in order to yield its most efficient results, would obviously need special implements. As an experiment it is proving of considerable interest and it emphasises the fact that high-powered tractors are being thought of as the haulage agents of the future in this type of farming. The Diesel tractor, however, is not part of the Messrs. Alley's normal equipment.

It is generally held that many of the errors in mechanised farming arise from the use of implements originally designed for use with horses. In the present case, the local implement agent was ordered to procure lists of the largest implements made anywhere in the world. If costs of production are to be kept down to the lowest level, then it is essential that the tractors should be harnessed to implements which give them economic loads. The choice of ploughs for use with the "Caterpillar" tractors fell on the four-furrow Massey-Harris, turning furrows 1 foot wide, following which a four-furrow land press is used. This is an interesting combination and one which gives excellent results on this light land. A disc plough is being experimented with at present, but it is not found to be any improvement over the mouldboard ploughs normally employed. The area ploughed per day is 10 acres with the "Caterpillar" tractors and 11 acres if the Massey-Harris tractor is used—or roughly an acre per hour.

A variety of harrows are employed. The heavy drags for cultivating are 20 feet wide; the light corn harrows cover a width of 32 feet, while Aitkenhead chain harrows, 30 feet wide, are used, after mustard has been ploughed in, for the purpose of making a seed bed. Full sized sets of harrows cover 12 acres per hour. There are two 11 feet wide Massey-Harris cultivators which, attached singly to the Massey-Harris tractor, have cultivated 5 acres per hour on the fallows. It is of interest to mention that the experimental Diesel tractor referred to will take both the cultivators with ease. The Cambridge roller is in three sections with a total width of 24 feet and covers 11 acres an hour. The Massey-Harris seed drill when imported was the largest in Europe. It has a width of 16½ feet and can sow 8 acres per hour, including the time taken up in filling with corn. This seed drill is found a most efficient implement, but it is now attached to the Massey-Harris tractor, since the "Caterpillars" are not geared high enough for rapid seed sowing. The artificial fertilisers are sown by two Bamford manure drills, which are coupled and have a span of 19 feet and a working capacity of five acres per hour, including the time occupied in filling.

The bulk of the harvesting is done with the aid of two Massey-Harris 12-foot-cut combine harvesters. These machines have been an unqualified success. Each is capable of clearing 2 acres of corn per hour during fine weather. These machines have revolutionised harvesting in the principal grain-growing countries of the world and in this country they have to be regarded as essential to this type of farming, especially if grain drying equipment is available. In the first year of their mechanised farming, the Messrs. Alley employed a 10-foot-cut Massey-Harris binder to do the bulk of the harvesting, and started with only one combine harvester. In that year it was found that only on a few occasions was it possible to cut and thresh the standing crop without any fear as to the soundness of the grain for storage purposes. Since then, however, provision has been made for grain drying, so that the use of the combined harvester-thresher no longer presents any problems. In the 1932 harvest, which with ordinary methods of securing the crops was very slow, it was possible to pursue a practically uninterrupted programme, so that the whole harvest was dealt with in the space of six weeks.

The existence of a long growth of straw appears to be one of the problems of this system of harvesting. When the Messrs. Alley laid their plans for mechanised cereal growing it was their intention to leave the straw in windrows and subsequently bale it for sale. During the 1932 harvest, however, it was decided so to cut the wheat as to leave a stubble of as much as 2 feet, and to burn the threshed straw. In order to avoid any risk of the fire's spreading to other fields, about 12 furrows were turned round the sides of the fields. Reference has already been made to the fact that grain collecting tanks have been attached to the combines, thereby economising labour. This device has also eliminated the need for using sacks in the field. Thus when the grain collecting tanks are full, they are emptied into the Ford lorry and taken direct to the grain dryer. After harvest the combines are protected against the weather by covering them in with bales of straw out in one of the fields.

The grain dryer is one of the most costly items in the Messrs. Alley's equipment. A machine known as a grain dryer and conditioner, made by Thos. Robinson & Sons Ltd., of Rochdale, has been installed—very similar to that employed by many millers. On arrival from the field the grain is dumped into a storage bin from which it is lifted by elevators to a rough cleaning machine. The grain dryer utilises steam-heated air and the grain is dried at a temperature of about 150°F. It is claimed that the use of steam for heating purposes overcomes the objections of millers who assert that coke-heated wheat carries a coke taint with it. The dryer has proved to be very

efficient and it is possible with this conditioner to extract any musty taints from wheat. The grain is cleaned after drying by a Boby "Cleenal" machine. The speed attained in drying depends on the moisture content of the grain, the extremes of output varying between 5 and 20 sacks per hour. Two shifts are worked during the harvest season, these being from 7 a.m. to 8 p.m., and 8 p.m. to 7 a.m. The total cost of the drying equipment erected at Bluestone Farm was just under £1,000, which includes the dryer, engine and boiler, cleaning machines, steam heater, bins, elevators, worms and gearing. As the capacity varies between 100 sacks and 400 sacks per day, the drying costs vary between 1s. 6d. and 4½d. per sack inclusive.

Costs of the different operations are being kept by Messrs. Alley, but it is not their present intention to publish the balance sheet of this farming experiment. The most to which they commit themselves is that their wheat-growing costs are under £5 per acre inclusive, and that they have averaged 8 sacks (4 quarters) of grain per acre in the 1932 harvest. The total cost of their equipment to date is £3,400, though this does not include any charge for the Diesel tractor with which experiments are being made. The following costs per acre are given for the cultural operations: ploughing, 7s.; cultivating, 3s.; harrowing, 7d.; drilling, 1s.; rolling, 9d.; and manure distribution, 1s. 6d.

It will be appreciated that this system of farming is sufficiently new to English agriculture to allow ample scope for experiment. Certain broad principles are accepted, but from observation of this farm during the past two years it is evident that the increasing experience acquired is responsible for modifications in the original plan. Technique and management are being perfected, and the entire scheme is intended to be an economic success. If sentiment was allowed to enter into consideration, one would probably deplore the development of mechanised corn growing on the grounds that it is calculated to reduce the number of regular farm workers. Sentiment cannot, however, suitably be considered at a time when East Anglian farming under the traditional methods is so much "under the weather," and it is unfair to criticise those who have preferred to realise their live stock, curtail the labour employed and mechanise. A frequent criticism at one time was that the ordinary agricultural labourer was incapable of efficiently looking after expensive tractors. In this instance no difficulty of the kind has been experienced. The two tractor drivers were formerly young horsemen with no previous mechanical training, who quickly became efficient and have entered into the spirit of the experiment with considerable enthusiasm. The men regularly employed are quite prepared to work the

long hours which the system involves in the rush periods ; a common working week at such times is from seventy to eighty hours for the tractor drivers. The men have also been equally anxious to fall in with any new ideas which suggest themselves. It may be mentioned in this connection that the round-and-round method of ploughing is extensively followed.

In summarising the main features of the Messrs. Alley's system of mechanised farming, the following points appear to be of outstanding significance.

1. The farm selected is ideal both in size, soil and shape for this particular system and for the transportation of large-scale implements from one part of the farm to another.

2. It has been possible to work a 1,000-acre arable farm for the past two years entirely without horse labour.

3. The total labour bill has been reduced under this system from about £4,000 to £700 per annum.

4. It seems unlikely that the fertility of the land will deteriorate from the treatment followed.

5. The introduction of combined harvester-threshers and of efficient grain-drying plant has overcome the climatic difficulties.

6. The system approaches most closely to the ideal of arable farming on factory lines.

The system is not in the best interest of the nation if viewed in the light of finding employment for labour, but the primary duty of a farmer is to safeguard his capital. No small measure of praise is due to the successful manner in which the two occupiers of Bluestone Farm have established the system. Though the land has been depopulated, the farm has been kept in a good state of cultivation, and is being run at a profit.

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DERBYSHIRE FARMING, PAST AND PRESENT.

THE principal product of Derbyshire farming is milk for liquid consumption, and the typical Derbyshire farm is a holding of about 100 acres on which the farmer himself takes a leading part as an operative. About three-quarters of the cultivated area of the county is under permanent grass and a large part of the farmland is situated between 500 and 1,000 feet elevations. There is, however, considerable diversity in the agriculture of the

province, from intensive market gardening at the one extreme to highland sheep farming at the other ; typical sheep and barley farming is represented ; there are farms on which the summer fattening of bullocks is the main enterprise, while individual holdings are specialised in fruit growing, pig breeding, chicken fattening and, of course, egg production.

The county cannot claim much distinction in the matter of the number of breeds or products bearing its name. There are, of course, the Derbyshire Gritstone sheep and Blue Albion cattle, the Red Cap Fowl and the Derbyshire and Peakland cheeses. The names of Harold and Chaddesden Darkie, however, are venerated by breeders of Shires and British Friesians respectively ; the Silcock Cup for the best herd of recorded dairy cattle in England and Wales has been won six times in the last seven years by Derbyshire competitors, whilst the Harris Cup for the best four sides of bacon at the last Dairy Show was secured by a farmer from the vicinity of Repton—a village known by its public school. In the matter of cheese factories and milk condenseries, the pioneer work done in Derbyshire merits fuller description.

In Derbyshire, as elsewhere, the features of the countryside are determined by the nature of the underlying rock strata and by climatic conditions ; and these in conjunction with railway and other marketing facilities determine the system of farming. The weather-resisting carboniferous limestones and gritstones underlie the uplands of the north-western, western and central portions of the county ; alternating bands of clay and sandstone in the coal measures strata form the undulating country on the Notts side, while the Keuper Marl formation and alluvial tracts form the extensive plain of which Derby is the commercial centre. On all of these several geological formations, however, conditions favour cattle farming for milk production. The liberal rainfall and comparative freedom from summer drought ensure good pasturage and sufficient supplies of water for dairy cows, and nearly every farm is within easy reach of a market for milk. One main route of the L.M.S. railway system crosses the county diagonally from N.W. to S.E., giving a direct service between Manchester and London ; another main route follows the other diagonal, serving Birmingham in one direction and Sheffield in the other.

The railways on which Derbyshire farmers depend for their long-distance milk transport were constructed during the middle of the nineteenth century. For years after the rail routes had been completed, however, towns continued to draw their milk supplies from urban and suburban cowsheds, while milk produced in the counties was converted into cheese or butter ; in Derbyshire it was cheese. The change-over from farm-house

cheese-making to milk-selling took place between 1870 and 1890, which was also the period in which the first British experiments were made in organising and running co-operative cheese factories. To-day farm-house cheese-making is rarely found in Derbyshire; very few farmers are equipped for the cheese process, and the art, where understood, is practised only in emergency.

DAIRYING.

It is not known how long Derbyshire farming has been devoted mainly to dairying. The song about the Derby Ram is probably reminiscent of the former importance of sheep in these parts; in the year 1800 there were 362,000 short-wool sheep in the county—two and a half times the present number of all breeds. Dairying probably began to assume importance during the eighteenth century when the population of England and Wales increased from about $5\frac{1}{2}$ millions to nearly 9 millions, and—the food supply being entirely home-grown—the expanding nuclei of our present centres of population required more foodstuffs than could be procured locally.

At the beginning of the nineteenth century, when John Farey made his Derbyshire survey for the Board of Agriculture, cheese-making was a principal feature in the farming business of the county. Butter was only a secondary consideration: few, if any, herds were kept expressly for butter production. The cows calved in spring; cheese-making began about mid-April and finished about the middle of November, and the average output of cheese per cow was about $4\frac{1}{2}$ "cwt." (120 lb.) from old-type Longhorns, and 3 "cwt." from the new type. The rennet was made from maw skins of sucking calves, cleaned, dried and salted by the butchers who sold it. A piece measuring 2 inches square, soaked for twelve hours in a tea cup of cold whey, was sufficient to clot the milk of 21 cows in one hour. The process of cheese-making was very simple and differed from the modern factory Derby process in that there was no heating of the milk or whey.

At the time of Farey's survey, there was a considerable trade in Derbyshire cheese, in the transport of which the canal system, developed during the period 1766–1811, played the principal part. At several of the wharfs on the navigations—Derby, Shardlow, Burton-on-Trent, etc.—large cheese warehouses had been built and an experienced person appointed as clerk of each. It was the business of the clerk to receive the cheese from the farmers' teams at appointed times, rejecting and returning any that were cracked, damaged or insufficiently dried, and to stack up, turn, rub and generally attend to the stock under his care. When the factors or dealers, on whose

accounts the cheese was sent in, made sales or contracts for quantities of cheese, it was the business of these clerks to see that none but perfect cheeses were sent out, by which means the uniformity and credit of the commodity was upheld. Apparently the quality of the cheese was allowed by later generations to decline.

Several cheese factors resided in or near the county; some of these bought 2,000 or more tons annually, principally on commission for London dealers or those who had Government contracts. In August the factors usually travelled round the county and called on the small dairymen to examine the cheese, bargaining for and marking those which they accepted. These small farmers, being obliged to sell for want of money, generally accepted the prices thus offered and within two or three days afterwards they delivered the cheese at the navigation warehouses.

Between the larger dairymen and the factors a strange practice prevailed: that of selling the cheese at the above-mentioned period without fixing any price. Fully half of the cheese was delivered into possession of the factors in September without any price being fixed until the time of final payment, two or three months later, the factors in the meantime advancing money on account. The prices were subsequently fixed by those ruling at Derby St. Luke's Fair in the middle of October or at others such as Burton, before or after this date. This practice was criticised by other farmers. Farey quotes the case of William Smith, of Swarkestone Lowes, who realised 81s. per cwt. in 1808 when the average price at Derby Fair a week earlier had been only 70s. Another farmer realised 82s., yet many had sold in September at 60s. Thus well over a century ago, and before imports had begun, there was a marketing problem.

The insignificance of the liquid milk trade in those times may be gauged from the fact that the milk was delivered twice daily to the milk hawkers in the towns in small conical barrels slung on the sides of donkeys or ponies. The winter delivery was about half of the summer quantity. The towns were, however, much smaller than now: Derby, for instance, had a population of only 13,043 in 1816 (142,406 in 1931), and many town cottagers kept their own cow.

Messrs. Strutt, owners of the cotton mills at Belper, encouraged milk consumption among their mill hands and tried to ensure a winter supply of milk by contracting with farmers at prices varying between 1½d. and 3d. per quart according to season. An employee served the milk out to the workpeople in the mills and kept accounts, and the amount due from each was deducted out of wages at the end of the week. Works' milk

clubs, recently revived and worthy of encouragement, have thus a precedent of some antiquity.

Between 1800 and 1870 Derbyshire farming partook of the general modernisation common to most parts of England—in buildings, mechanical equipment and methods of cropping and feeding, and the Shorthorn ousted the Longhorn as the dairy cow of the county. There was a gradual increase in the numbers of milk beasts and a reduction in the sheep stock; but the domestic manufacture of cheese remained the principal feature of the husbandry, enlarged in importance by the increased demand for, and output of, the product. Two or three influences now came into operation which, on the one hand, inaugurated the rail-borne milk trade and on the other transferred the work of cheese-making from the farm-house to the factory. The scourge of Rinderpest in 1865 left many of the town cowsheds empty, so that supplies of milk had to be brought in from distant country districts; Derbyshire was early engaged in this trade, having both the cows and the railway service. For the same reasons the home supply of cheese was reduced, so that consumers had to purchase American cheese, against which there had previously been prejudice owing to its former poor quality and foreign origin; it was now of superior quality and readily accepted. The result was an increased demand for American (factory made) cheese on its merits, followed by a serious fall in the price of the home product.

The marketing of large quantities of American cheese of standard quality in opposition to the variable English home-made article led to discussion of the question of adopting the factory method of cheese-making in this country. On July 1st, 1868, the Council of the R.A.S.E., on the motion of Lord Vernon of Sudbury, a Derbyshire landowner, requested the Journal Committee to obtain information as to the working of the cheese factory system in America and its adaptability to the dairy districts in England. Various causes, including the long illness and subsequent death of Mr. Frere, editor of the Society's Journal, combined to delay the enquiry, and the publication of the Report. The Report appeared in Vol. 31 (1870) of the Journal. Meanwhile the matter was receiving serious attention in Derbyshire.

At the annual dinner of the Derbyshire Agricultural Society on September 15th, 1869, the Chairman, Mr. J. G. Crompton, of Windley, urged the necessity for prompt and decisive action to improve the quality of Derbyshire cheese; and on the 20th of the same month, at a meeting of the Midland Agricultural Society at Alfreton, Mr. James Nuttall, a dairy farmer of Chaddesden, advocated the establishment of cheese factories in the county. From the Hartington district came a proposal that

a representative should be sent to America to bring back first-hand information on the factory system : he (Mr. J. P. Sheldon) did make the trip two years later. At a general meeting of the Derbyshire Agricultural Society on December 24th, Mr. Crompton gave particulars of the American system, and Lord Vernon moved the appointment of a committee to prepare a scheme applicable to Derbyshire. This Committee reported on February 18th at a large gathering of members presided over by the Duke of Devonshire.

The Committee recommended that the factory system should be given a fair trial extending over three years ; but in order to insure contributors of milk against any loss in case of failure or from the produce being lower in market value than the average home-made cheese, the Committee also recommended that landlords and others interested should be invited to subscribe to a guarantee fund. This was quickly forthcoming, some £3,000 being obtained within 48 hours ; and it was resolved that 6½d. per gallon be paid for milk during the manufacturing season and the balance, if any, when the year's produce had been disposed of. The guarantee fund was also to be available for compensating any landlord who suffered loss through erecting a factory on his property and placing it at the disposal of the committee.

The first factory to be opened—the first in England, in fact—was one in Siddals Road, Derby, in premises placed at the Committee's disposal (rent free for the first year) by Mr. Roe, of Derby. This factory, originally a cheese-factor's warehouse, was 60 feet by 30 feet, and consisted of three floors, one being underground. It adjoined the Derby canal and Mr. Roe's timber yard. The first cheese was made on April 8th, 1870, the milk supply having been drawn from thirteen farms with an aggregate of 300 cows. The factory was equipped with plant made locally under the direction of an American cheese-maker, who had been brought over specially to manage the factory.

The Committee had proposed to begin with a single factory in the county and had held meetings and inspected sites at Sudbury, Longford, Etwell and Weston Underwood. Both the Hon. E. K. W. Coke, of Longford, and C. E. Newton, Esq., of Etwell, had offered to furnish the Committee with the requisite buildings and by a majority vote Longford was decided upon. The factory was erected in the spring of 1870 ; it was built of wood, partly to save time and money and partly to satisfy Mr. Shermerhorn, the American manager. A brother of the latter was brought over to manage the new factory and cheese-making began here on May 20th with the milk of 500 cows supplied by 27 farmers.

These two pioneer factories had their early difficulties, but

both succeeded in making slightly more than the guaranteed price of $6\frac{1}{2}d.$ per gallon for the milk and produced cheese of good quality, realising 80s. per "hundredweight" in 1870 and 74s. 6d. in 1872. A vast number of people visited these factories—including delegates from Denmark and Russia—and their records and accounts were published for the guidance of others.

In 1873 Windley Hall factory was started on the estate of Mr. J. G. Crompton and manufactured 34 tons of good cheese in that year. In the following year Derby and Windley factories began to send away milk for liquid consumption; the Holms factory at Ashbourne was started and at Mickleover (?Etwall) a large and commodious building was erected by Mr. C. E. Newton, the owner of many of the farms supplying the factory; Cheddar cheese was made here by a Somerset man. In this year factories were under consideration at Sutton-on-the-Hill, Kedleston, West Hallam, Grange Mill and Hartington. The last two materialised in 1875. Brailsford, Duffield, Gratton, Higham, Marston Montgomery, Sudbury and Willington were other centres at which cheese factories were later established.

Home cheese-making continued in competition with the cheese factories and the milk trade after 1870; by 1880 domestic cheese-making had fallen off one-half and the sale of milk had more than doubled in the interval. At the time of the Derby Royal Show in 1881, it was estimated that of all the dairy farmers in Derbyshire within 5 miles of a railway station, quite half sold their milk. During the next few years the remainder changed over to milk selling, the desire of the farmer's women-folk to be relieved of the labour and anxiety of the cheese process prevailing even in the face of unsatisfactory milk prices. This attitude was not left uncriticised, but the revolution was completed.

By 1888 the co-operative factory system had begun to break down. Some of the factories had been let to private cheese-makers, who purchased the milk and either made it into cheese or sold it for liquid consumption according to circumstances. Other factories made cheese only during five or six months of the year and were closed for the remainder of the time, during which period the contributing farmers disposed of their milk by private arrangement. In other cases the factories served only as depôts for milk dealers, cheese-making being practised only as a means of utilising surplus milk. Although the factory system was only an intermediate stage in the change to milk selling, it was recorded as having done "great and lasting good to Derbyshire farmers. . . . It has broken the monopoly formerly enjoyed by the old cheese-factors, has shown the farmer the value of his milk, has enabled farmers to realise larger incomes,

and has delivered them from the vicious system of getting money in advance from cheese-factors, with the inevitable result of being compelled to accept any price that might be offered when the day of settlement arrived."

The decline in the price of cheese during the '80s and the relatively high price of milk for liquid consumption was the prime cause of the decline of the factory system. Stirton, writing in 1888, records, with reference to the diversion of milk from the factories, "this has been brought about by the lower prices offered by the factories. The price paid a few years since was 7*d.*, now it is 5*d.* or 5½*d.* per gallon in summer. . . . On the other hand, cheese makers cannot have a great margin of profit, even with milk at 5*d.*, when cheese at the factories sells at 50*s.* per cwt."

The development of the milk trade was not at first looked upon with favour by land owners; they believed that the fertility of their farms would be exhausted by selling off the milk instead of only the cheese, as the consumption of the whey by pigs involved the use of purchased feeding stuffs and the making of manure. It is noteworthy that the only real cause for anxiety in this connection has arisen when the excessive use of purchased feeding stuffs for milk production has created such a large outgoing valuation that the landowner has not always readily found a new tenant able to pay the valuation. Another criticism of the change-over to milk selling, current about 1880, was based on the fear that the supply of milk would soon exceed the demand; but as the town population had then only just begun to appreciate milk as an article of diet and cookery, more and more farmers were able to find buyers for their milk.

The growth of traffic in milk is illustrated by the following statistics of the volume carried from Derbyshire by the Midland Railway:—

1872.	940,000	gallons.
1880.	5,500,000	"
1888.	8,393,292	"

If one may judge from the cow population of the county in different years, it would appear that production began to overtake demand about 1888, by which time dairying had attained considerable development in other counties where corn lands had gone down to grass. About the beginning of the twentieth century, however, the numbers of milch cows began to rise again, due, it is suggested, to the establishment of the milk condensing industry in this country.

The first condensery built in Britain was that at Hatton, near Tutbury. The Nestlé Condensed Milk Co., of Vevey, Switzerland, came to Hatton in 1900, this locality being chosen on

account of the intensity of milk production in that area—a district from which special milk trains were run to London. The Nestlé Company purchased a creamery opened two years previously by Messrs. Edwards and Son, of London and Market Drayton, and took over the existing milk contracts—the produce of about 2,000 cows—so that a rapid start could be made. The new building was opened in December 1901 with a maximum capacity of 30,000 gallons of milk per day. Another large condensery was erected at Ashbourne in 1912.

Apart from providing a new market for milk in the Hatton and Ashbourne districts, Messrs. Nestlé made the following innovations :—

1. The 10-gallon can in contrast with the 17-galloner.
2. Organised road transport by districts for collection of milk.
3. Buying milk by weight instead of by barn gallon of 17 pints.
4. Acceptance of the whole fluctuating output of a dairy under a twelve-months' contract with fortnightly payment.
5. Systematic friendly inspection of dairies to advise on clean milk production.

At the time of the outbreak of the European War, Derbyshire farmers had again begun to discuss cheese factories, this time as an aid to milk selling. Milk contracts were made at the end of March when the supply was abundant and circumstances favoured the buyer. Typical prices were $6\frac{1}{2}d.$ per gallon for the summer period and $8\frac{1}{2}d.$ for the winter, less $\frac{1}{2}d.$ — $1d.$ per gallon for carriage. Cheese prices had, however, gradually risen to 70s. per cwt. and more for best qualities, so that the most remunerative way of dealing with milk was to make cheese in summer and sell milk in winter. New factories were opened at Burton-on-Trent and Earl Sterndale in 1913, and Brailsford cheese factory was re-opened in 1914 by a new farmers' co-operative society. Both Earl Sterndale and Brailsford factories are still running, but now serve more as milk depots than as cheese-making centres; the Brailsford Society has developed and owns a fleet of motor lorries with which milk is transported to Sheffield, Birmingham and other cities.

Just after the war a larger scheme of agricultural co-operative enterprise was promoted, which embraced the old cheese factories and depôts at Willington, Mayfield, Ashbourne, Grange Mill, etc.; economic conditions militated against the success of this concern and in recent years its operations have been continued on a reduced scale. Nevertheless this organisation has rendered valuable service by the utilisation or disposal of milk

on behalf of farmers who have not been well situated for direct sale or who, as in the autumn of 1932, have had difficulty in finding a buyer.

In 1929 the Agricultural Economics Research Institute, of Oxford University, conducted a farm-to-farm survey of milk production and marketing in Derbyshire and issued a report of 70 pages with maps and diagrams. In June of that year, the Report states, the daily production of milk was 103,535 gallons, of which 75 per cent. was sold wholesale, 14 per cent. retailed by the producers, and 11 per cent. utilised on the farms. Of the last-mentioned quantity only 2.4 per cent. was disposed of by domestic manufacture, and that was almost entirely in the form of butter, made with milk surplus over liquid sales; domestic cheese and cream manufactures were rare.

The Report does not attempt to give the final destination of the whole of the 92,000 gallons daily sold off the farms in Derbyshire; the problem is complicated by the re-sale of milk by manufacturers. It states, however, that almost 26,000 gallons are consumed within the county; 31,000 sent to London and 9,000 gallons to Sheffield. Manchester is also a large buyer of Derbyshire milk and smaller quantities are sent to Birmingham, Nottingham and other centres.

More recently the Longford cheese factory has been acquired by a Birmingham milk distributing firm and last year a Sheffield Industrial Co-operative Society diverted the considerable output of the Ecclesburne Valley from the London destination; the milk from this area is now collected by motor lorries sent from Sheffield, a distance of about 30 miles. On the other hand a London firm has diverted a daily output of about 6,000 gallons from the Rowsley area and is erecting a cooling depôt with a view to railling the milk (to London) in tanks. Tanks are already in use for the transport of milk by rail from Ashbourne to London and by road from Longford to Birmingham.

Derbyshire milk has a long-established reputation for its keeping quality. This property is due, not—as erroneously stated in the 1881 Report—to the purity of the water supply, but to clean production methods based on the cheese-making traditions; good cheese could only be made from clean milk. In recent years 75 per cent. of the numerous samples examined by the Public Health Department of the County and County Borough of Derby have been reported to be within the bacterial limits of Grade A Standard. In the County Clean Milk Competitions the successful dairies must almost invariably produce samples of super-Certified standard with a capacity to keep sweet for at least three days. These competitions, which have been conducted for several years, are run during the summer months when the difficulties are greatest and the differences due to

technique most marked, and all samples are taken at surprise visits.

Many Derbyshire farmers have introduced steam sterilising equipment, covered pails and covered coolers, and practise udder washing. Wet hand milking is never permitted. The majority would be glad to become registered producers of Grade A milk; very few, however, are able to find buyers who require milk of this description. Most of the city milk distributors practise pasteurisation and they are not prepared to discriminate between dairies whose milk does not require treatment and those whose produce is unreliable. Only three firms purchasing Derbyshire milk pay a bonus for excellence in this respect.

DERBYSHIRE CATTLE.

During the seventeenth and eighteenth centuries the cattle kept in Derbyshire were of the Longhorn type and both Gervase Markham (1683) and Mortimer (1716) refer to the breed kept in this and the adjoining counties and Lancashire as being the best. About the time of Mortimer's book, Sir Thomas Gresley, of Drakelow House, near Burton-on-Trent, had a good herd; he preceded Robert Bakewell in the work of cattle improvement. From him both Welby of Linton and Webster of Canley obtained their foundation stock, and the original stock of both Bakewell and Fowler, of Rollwright, were Canley cattle.

The Dishley type of Longhorn never became widely distributed among the working farmers of the county, though it was claimed that it had a beneficial influence on the dairy cattle as a whole, giving them a somewhat earlier maturity, finer bone and better beef qualities. The New Longhorn, however, was not so productive of milk as the old.

Short-horned cattle began to invade Derbyshire about the beginning of the nineteenth century. Hailing from the counties of Durham and York, these cattle had a great reputation as milkers and were much in demand by metropolitan dairymen. According to tradition they were of Dutch origin. In Derbyshire there was at first a prejudice against them as lacking hardiness and producing poor milk, but they rapidly became established as the common dairy cattle of the county. Youatt, writing in 1833, mentions that there were few dairy farmers, especially in the Derby district, who had any Longhorns in their dairies; there were, however, herds of this breed in the county till a much later date.

Some fifty years later, the breeding of utility Dairy Short-horns had reached a high degree of excellence in Derbyshire. Special mention of this is made in the report of the judges of the R.A.S.E. farm competition, 1881, and in the descriptions of the

on behalf of farmers who have not been well situated for direct sale or who, as in the autumn of 1932, have had difficulty in finding a buyer.

In 1929 the Agricultural Economics Research Institute, of Oxford University, conducted a farm-to-farm survey of milk production and marketing in Derbyshire and issued a report of 70 pages with maps and diagrams. In June of that year, the Report states, the daily production of milk was 103,535 gallons, of which 75 per cent. was sold wholesale, 14 per cent. retailed by the producers, and 11 per cent. utilised on the farms. Of the last-mentioned quantity only 2.4 per cent. was disposed of by domestic manufacture, and that was almost entirely in the form of butter, made with milk surplus over liquid sales; domestic cheese and cream manufactures were rare.

The Report does not attempt to give the final destination of the whole of the 92,000 gallons daily sold off the farms in Derbyshire; the problem is complicated by the re-sale of milk by manufacturers. It states, however, that almost 26,000 gallons are consumed within the county; 31,000 sent to London and 9,000 gallons to Sheffield. Manchester is also a large buyer of Derbyshire milk and smaller quantities are sent to Birmingham, Nottingham and other centres.

More recently the Longford cheese factory has been acquired by a Birmingham milk distributing firm and last year a Sheffield Industrial Co-operative Society diverted the considerable output of the Ecclesburne Valley from the London destination; the milk from this area is now collected by motor lorries sent from Sheffield, a distance of about 30 miles. On the other hand a London firm has diverted a daily output of about 6,000 gallons from the Rowsley area and is erecting a cooling depôt with a view to railling the milk (to London) in tanks. Tanks are already in use for the transport of milk by rail from Ashbourne to London and by road from Longford to Birmingham.

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various farms visited there is evidence that the judges were very favourably impressed with the dairy herds. Mr. George Bryer, of Markeaton Park, had "from 50 to 60 capital specimens of Derbyshire Shorthorns" and his books revealed that they yielded about 40,000 gallons per annum besides the milk fed to calves. Mr. John Hellaby's, of Twyford, strongest point was his cows. The judges reported, "We know not where to look for 36 such grand dairy cows. . . . For size of frame, for quality and character, for meat and milk producing properties all combined and in such perfection, they would be hard to beat. The owner says they have no pedigree. . . . He and his father set before them an ideal dairy cow; for years they have striven to reach that ideal, and we now see the result. . . ."

In their introductory remarks the judges discuss the attitude of Derbyshire farmers at that time towards pedigree and show cattle. "Now and then," they reported, "we came across a pedigree bull; but we were constantly told that those dairy-farmers who relied upon the Herd Book for their bulls 'soon pedigreed their milk away.' The pure bulls used at Croxden had been selected with great care from . . . tribes noted for their heavy milking properties; but it was only a few thorough-bred cows which proved themselves prolific milkers." Another note on the Derbyshire herds appearing in the Journal for 1881 says, "There are . . . fine herds of capital, roomy, massive Shorthorns, with plenty of flesh and hair and above all yielding milk in such profusion that would make many a high breeder disgusted with his own stock. Few of these animals can boast of any pedigree save that of being descended from heavy milkers, and having for their sire a bull selected for a similar reason."

It is difficult to compare the cattle of to-day with those of 50 years ago. The older generation of farmers contend that the level of quality is not now so high as formerly. This contention appeared in a note on Derbyshire cattle in this Journal of 1905 (p. 220) in which it was stated that "the large framed, old stamp of dairy cow is not met with in the numbers it used to be; beasts of from twelve to fourteen years old, apparently as good as ever, except for age, are not nearly so numerous, the animal to-day appearing quite as old at eight or ten years of age. 'Screws' are more plentiful, and tuberculosis is more prevalent. The living of the cow is quite altered, to increase the supply of milk the food given has to be of the most forcing kind, and consequently . . . the whole of the food supplied has to be of a mined character. . . . Formerly choppers and pulpers were unknown machines in connection with the cowshed. . . ."

It is not unlikely that the modern herd is of younger average age and it certainly is less home-bred than that of the cheese-making days. In the earlier period the cows calved at the

natural time—spring—and had not to produce milk in winter with the aid of artificial foodstuffs; they would, therefore, wear longer, breed more regularly and be less frequently affected with udder troubles. Winter milk production also necessitates frequent purchases of newly-calved cows to maintain uniform output, and this gives the herd a mixed character. The most severe critics of present-day cattle offered in the public auctions are the dairy farmers themselves when seeking good cows to add to their herds. Local farmers do not often sell their best—they are themselves buyers. Many of the cows offered for sale are not of local origin.

The average yields of the herds in the Derby District Milk Recording Society are usually at or near the top of the list for the whole of England and Wales. The Derby Society's figures for 1931-32 and the six preceding years respectively were as follows: 8,440, 8,109, 7,974, 7,986, 7,282, 7,619 and 7,535 lb. Few societies can show such a high average yield year after year. The 63 herds recorded in 1930-31 comprised the following breeds: 42 non-pedigree Shorthorns (generally the largest herds), 4 mixed pedigree and non-pedigree Shorthorns, 2 pedigree Shorthorns, 9 British Friesian, 2 mixed British Friesians and non-pedigree Shorthorns, 2 Red Poll, 1 Lincoln Red and 1 Jersey. The average number of cows and heifers recorded per member was 33, of which about 9 were heifers.

The herd averages for the Peak District Milk Recording Society for 1930-31 and the four preceding years are also creditable, *viz.*: 7,558, 7,806, 7,492, 7,031, and 7,310 lb. respectively. The herds here are, however, smaller; the average number recorded in 51 herds being 24 cows and heifers. Here also several breeds are represented, including 4 herds of British Friesians on fairly high-lying farms, one of Ayrshires and one of Welsh Blacks.

The non-pedigree Shorthorn constitutes a greater proportion of the total dairy cattle of the county than the above particulars of the recorded herds would indicate. Red colour is preferred in the southern half of the province and dark roans are the most popular in the northern half, where also a considerable number of farmers are "grading up" though not all recording milk yields. Pedigree Dairy Shorthorn herds are now very rare in Derbyshire, though several have been formed and dispersed again during the last twenty years. Owners of British Friesian herds, on the other hand, are as a rule pedigree breeders and recorders, whether they are working farmers or gentlemen farming for amusement.

In passing, special mention should be made of the Chaddesden Herd of British Friesians with which Messrs. Willett have won the Silcock Cup four years in succession. This herd, whose

average annual yield is about 1,400 gallons per full year cow, is the result of continuous systematic breeding by working tenant farmers, whose interest in this breed began in 1909 with the purchase of two heifers at Mr. John Brown's sale: one of these was Chaddesden Darkie.

Mr. Goodwin's home-bred herd of Lincoln Reds at Darley Dale, with a consistent herd average of about 1,000 gallons, is another instance of successful pedigree breeding by a tenant farmer.

Dairy cows in Derbyshire lie out at grass from the beginning of May, or a fortnight later in the uplands, till about the end of October. They may continue to go out in the day-time for a few weeks longer in a dry autumn; but in ordinary seasons the grazing period is cut short by the state of gateways, etc., which begin to tread up and become muddy during a wet November. Generally the pastures nearest home are reserved for night fields, land farther away being grazed during the day. In winter the cows are turned out into the yard once or twice a day for water, exercise and contact with the bull while the sheds are cleaned and aired. Even where water bowls have been installed, the daily airing is commonly given. Indoor watering arrangements are very popular, favouring yields in the case of the flush milkers and preventing digestive troubles generally.

Most Derbyshire farmers ration their cows more or less systematically, the practice having extended steadily during the past twenty years. The typical maintenance ration consists of 20-50 lb. of cut roots given at one feed and 18-14 lb. of meadow hay fed long in two feeds. The concentrates, fed at the rate of about $3\frac{1}{2}$ lb. per gallon of milk yield, are typically 1 lb. of soya bean meal, 1 lb. palm kernel or compound, and $1\frac{1}{2}$ lb. of cereal meal or crushed grain. Where brewers' grains are fed, a common allowance is about 20 lb. per cow per day, which displaces the allowance of concentrates for the first gallon of milk. Owing to the decrease in brewery activities and the development of grains-drying, supplies of wet brewers' grains have diminished and smaller quantities are fed; many use no "grains" at all. It is, however, still a common practice to ensile a supply for winter use; purchased at comparatively low prices during the summer, the grains are trampled down firmly in brick or stone-lined rectangular pits in the ground and covered over. During the summer period the more progressive farmers are using concentrates of the cereal-meal class, but restricting the allowance to cows yielding upwards of 2 or 3 gallons according to circumstances. Mineral supplements are extensively fed, several local merchants supplying a simple iodised mixture made according to the prescription of the County Agricultural Organiser.

CALF REARING.

The typical Derbyshire farmer rears all his suitable heifer calves, *i.e.*, good calves, dropped by cows of suitable type and productivity. The bull calves are generally marketed at a few days old, excepting those fed for veal in spring; they are rarely reared as bullocks.

The rearing calves are fed with whole milk only for about three weeks, at which age they begin to consume a little trough food as well as hay. As capacity to eat dry food develops, the milk allowance is gradually reduced and (unless water is kept within reach) the volume made up with water, until the milk can be discontinued altogether at about 3 months' age. A typical calf meal is made with equal parts linseed cake, palm kernel and crushed oats (or other cereal). Progressive farmers add either fish meal or minerals to the calf meal and give each calf a daily allowance of about a tablespoonful of good cod liver oil, which is particularly beneficial in winter with little whole milk.

Spring and summer dropped calves are generally allowed out on pasture when old enough to graze. On many farms, however, care has to be taken to avoid "husk"; "blackleg" or "irons," another risk on some farms, is now prevented by vaccination.

Yearlings and stirks commonly stay out at grass until the end of the year, when they are brought indoors and tied up—fold yards are not available on typical dairy farms. While indoors, the young cattle are fed chiefly on hay, with a few roots and wet grains if available; but animals between the ages of 1 and 2½ years do not ordinarily receive much concentrates. They go out to the rougher grass about April. Wintering out is practised to some extent, chiefly where there is insufficient housing room for the cattle.

Heifers are generally brought into the milking herd at 2½–2¾ years of age. Some farmers favour the earlier age for the first calving, allowing a long interval before the second conception. Others prefer the heifer to have a little extra age at the first gestation. The object is the same in both policies—to avoid undermining the animal's constitution. There is no doubt that the size, type and durability of the cow is greatly influenced by her treatment during the first 3 or 4 years of her life.

BEEF PRODUCTION.

The typical Derbyshire dairy farmer advisedly restricts his winter cattle fattening activities to the feeding out of his draft cows and heifers: he never lays in store stock for winter feeding.

One or two, who maintain their herds by purchasing down-calvers or newly-calved cows, however, rear their calves and feed them for baby beef. In the arable district east of Chesterfield, the ordinary arable farm fold-yard fattening of Irish stores is practised. Summer fattening of bullocks and heifers or young cows is found on certain farms in South Derbyshire which have an area of feeding pasture, chiefly river "meadows." Commonly the feeder gives starchy concentrates to his grazers, in order to finish his beast in early summer while prices are at their best.

SHEEP IN DERBYSHIRE.

As mentioned in an earlier paragraph, Derbyshire was at one time an important wool-producing county. From 1800 to 1867 the sheep population of the province declined from 362,000 to 258,000, due to the expansion of dairying. The same tendency continued throughout the nineteenth century, excepting during a few years about 1890, the reason for which exception is obscure, unless it was a partial recovery from the serious losses in numbers due to liver rot in 1879-81. During the present century the changes in sheep population have been small and attributable to variations in values of sheep products.

Permanent breeding flocks are found in the sheep-moor country on the Yorkshire and Cheshire borders. Blackfaces, Gritstones and Lonks are bred and recently the Swaledale has replaced the latter two breeds on some hill farms.

Lincolns, locally known as Limestones, are still bred pure on some of the limestone uplands between Buxton and Wirksworth, but the number of registered flocks has diminished to about three. The recent fall in wool values has strengthened the growing preference for dark-faced Down and cross-bred sheep, which are superior for mutton. Oxford and Suffolk rams are now more numerous than Lincolns in the limestone district. The half-bred or "Baumshire" ewe is popular for crossing with the Suffolk ram, but Kerry Hill and Clun ewes have been introduced with success. Kerries are favoured on the gritstone hills between Chesterfield and Bakewell.

The modern preference for smaller, leaner joints is not helpful to the sheep and cow farmer of the limestone uplands. On farms situated at 900-1,200 feet elevation, some of the grassland is best adapted for grazing by year-old sheep that have been wintered as lambs in lower country. Fat Lincoln mutton of this size, however, is not now in demand and the wool clip is likewise of reduced value.

Sheep also occupy an important place in the arable district overlying the Magnesian Limestone formation in the Bolsover-Welbeck district. Here Lincolns have passed entirely out of

favour; the flying flock of Baumshire ewes, crossed with a Suffolk or Oxford ram, has taken the place of the regular home-bred stock of Lincoln ewes for the production of hogs to be folded on roots.

In the lower parts of the county, which are devoted wholly to dairying, regular breeding flocks are not common. Most of the larger farmers, however, run a flying flock for the production of fat lamb. Kerry Hill or Baumshire draft ewes are purchased about the beginning of September and crossed with a Down ram—Suffolk, Oxford or Hampshire. The ewes also are generally sold fat after one crop of lambs. During the last few years many of the ewes have suffered from liver fluke, and heavy mortality about lambing time has occurred on some farms in spite of drenching with modern remedies.

PIGS.

In the old cheese-making days, Derbyshire had a larger number of pigs than are now kept, 47,000 in 1867 for instance, compared with 31,000 in 1914 and 37,000 in 1931, a year of increased pig population. The milk seller has little dairy by-product to use up by pig feeding; and the limited demand for fresh pork and "home-cured" bacon, has hitherto restricted the expansion of pig-keeping as a special branch of Derbyshire farming.

The class and size of pig are determined by local butchers, a subject dealt with comprehensively in the Ministry of Agriculture Reports, Economic Series Nos. 12 and 17. The best prices are realised by porkers weighing about 130 lb. carcase weight and known as "cutters." For bacon a pig of about 190 lb. carcase is desired in the Derby district, but Chesterfield and Burton curers will accept heavier weights.

The Large White is the breed most commonly kept in Derbyshire and there are a few good pedigree herds in the county. The herd from which Denmark obtained her first Large White boars, however,—Barrons of Borrowash—is no longer in existence. The Large Black sow is more popular than the Large White with many farmers, who consider that she is more prolific, a better mother and a heavier milker, besides being an excellent grazer.

Farmers who purchase stores for fattening prefer the blue spot cross, bred by crossing a Large Black sow with a Large White boar that breeds blue and white and not black and white pigs. These crosses grow rapidly and make good carcasses, free from seedy cut. It was with pigs of this cross that Mr. T. L. Ward, of Repton, won the 1931 awards of the B.D.F.A. for efficiency of production and the Harris Cup for the best sides of

bacon in the Dairy Show. These pigs—a litter of 10 farrowed in a field hut—weighed 48 lb. each at 8 weeks old and 196½ lb. each at 23 weeks old. To this age they had run out on grass and received a ration gradually increasing to 6 lb. per head per day at 20 weeks.

There are a few pedigree herds of other breeds—Middle Whites and Wessex, for example, and the Middle White boar has its advocates for crossing purposes. Messrs. Nestlé, of Hatton, who fatten 200–300 pigs to 200 lb. carcase weight every year, have during the past four years used Middle in place of Large White boars on their pedigree Large White sows, the cross-bred attaining the desired weight in one month less than the pure Large White previously kept.

HORSES.

Derbyshire figures prominently in the history of the Shire horse and the noted Clydesdale breeder, Lawrence Drew, in the period 1870–1880, purchased Derbyshire mares from the Scarcliffe district expressly for mating with Prince of Wales, from which combination he bred a remarkable succession of first class animals, which won the highest honours.

The earliest strain of "Shire" horses was of Derbyshire breeding. The Gallemore stud was in existence in the Ashbourne district as early as 1745, and it is believed that Lord Chesterfield, of Bretby Hall, imported a number of Dutch mares about 1755, which played an important part in giving Derbyshire the lead among the breeders of black cart horses.

Shire breeding attained its zenith and Derbyshire the peak of her fame in this branch of farming, however, during the last two decades of the nineteenth century and the early years of the present century. The Ashbourne district became the Mecca of the Shire Horse world, and the Derbyshire studs at Chatsworth, Barrow-on-Trent, Hopton, Markeaton and Millers Dale were looked upon as centres of the best blood. Calwich, near Ashbourne, however, is actually in Staffordshire.

While recognising the tenant farmers' dependence on the stud owner, due credit must be given to the skill and enterprise of the former and it is noteworthy that the famous sire Harold and the brood mare Lockington Beauty were both bred by tenant farmers. Contrary to common belief, neither was bred on limestone soil; indeed it is a popular fallacy that Derbyshire horses owe something to this geological formation.

Harold was bred by the late Mr. J. H. Potter, of Spondon, in 1881 out of a big black mare with a white patch on her near side. He owed his life as a sire to the persistence of Mr. Potter's son who had failed in objecting to the castration of a previous colt—a full brother—but who succeeded in preventing the same fate

for Harold. This horse was again nearly lost to the Shire world of this country when he was despatched, by one of his several successive owners, for export to America. Fortunately lameness on his arrival at Liverpool resulted in his being sent back home.

As a two-year-old Harold was sold for 80 guineas. As a three-year-old, however, he was bought by Mr. Duncombe of Calwich for 500 guineas from Lord Hindlip, for whom he had won the Junior Champion Cup in London. As a mature horse he stood 18 hands high and had beautiful appearance and action. He himself won the Cup in London, but his fame was established by the winnings and values of his offspring. For ten successive years Harold headed the list of winning sires, and his sons, Rokeby Harold and Markeaton Royal Harold, were London Champions. Another son, Prince Harold, stood at Calwich for a time and was later sold for 2,500 guineas to Lord Llangattock; and still another, Calwich Blend, was sold to King Edward for 3,000 guineas. It is noteworthy that Mr. Duncombe did not impose heavy stud fees for Harold's services. At first the fee was only £3 3s. 0d., and £10 10s. 0d. was the maximum. Working farmers in the Ashbourne district could, therefore, put their best mares to Harold and his sons—which they did with immediate financial benefit to themselves and improvement in their succeeding female stock.

William the Conqueror was another Derbyshire horse whose name appears in the pedigree of many famous Shires. Four of his sons were themselves London Champions in their day and two of these, Prince William and Hitchin Conqueror, headed the Lockinge and Menestrel lines of blood respectively. At one time, William worked in a timber dray.

Lockington Beauty, of Lockington and later of Batsford fame, one of the most successful brood mares of all time, was bred by a small farmer at Morley near Derby. At the time of her sale to Mr. Potter of Lockington, she was grazing by the roadside. She was the dam of Prince William by William the Conqueror.

Since the war, the values of cart horses have so declined that breeding has been continued on a much reduced scale. Nevertheless there is still good blood in the district and Derbyshire farmers are interested in horse breeding. At the time of writing arrangements are being made for the hiring of a good Shire stallion for the Derby district.

POULTRY KEEPING.

Derbyshire farmers have increased their stock of fowls from 484,168 in 1921 to 985,612 in 1931. Concurrently with this increase of more than 100 per cent. there has been general

improvement in breeds, breeding, feeding, housing and disease prevention. Pure-bred White Wyandottes and Rhode Island Reds predominate and the importance of strain is receiving greater recognition; good field and semi-intensive houses have been installed, and balanced mashes, mixed according to the recommendations of the County Agricultural Institute, are supplied by local corn merchants. The most progressive farmers subject their breeding stock to the blood test for Bacillary White Diarrhoea infection, hatch their chickens early enough for autumn laying, and rear indoors for the first few weeks with the assistance of cod liver oil as a preventative of rickets.

During the past two years, the prices of poultry products have rapidly declined, eggs having fallen below pre-war levels, and there has been a growing difficulty in marketing surplus cockerels. At the present moment, therefore, this branch of farming is in an unstable position, its future depending on the solution of the marketing problem.

GENERAL AGRICULTURE OF DERBYSHIRE.

The total land area of the county is 643,333 acres, roughly 1,000 square miles. Of this, 450,733 acres are cultivated and 80,310 acres are returned as rough grazings (principally uplands) leaving 92,290 acres of mountain area and of land occupied by towns, roads, etc. The cultivated area is utilised as follows: permanent pasture 55 per cent., permanent mow meadow 27·7 per cent., arable land 17·3 per cent.

Agricultural Returns. The following table summarises the cropping and stocking of the county—per 100 acres—at various periods:—

	1874	1914	1919	1927	1931
Permanent grass	72	84	77	82	83
Arable land	28	16	23	18	17
Total	100	100	100	100	100
Corn crops	15	8½	13½	9	8
"Seeds"	6½	3½	4	4	4½
Roots and green crops . .	4½	3½	4½	4½	3½
Bare fallow	2½	½	½	½	½
Farm horses—workers . .	2½	3	3½	3	3
others . . .	1½	3	2½	1½	1½
Dairy cows and heifers . .	13½	16½	15½	17	19
Total cattle	29	30	33	34	33½
" sheep	55	28	27	29	32
" pigs	8	6½	5	7	7½

The salient features of the table are the decline of arable cultivation and sheep and increase of dairy cows in the period 1874-1914. The figures for 1919 represent the changes invoked by war-time conditions. The last two columns indicate the reversion to pre-war cropping with, however, an increased number of dairy cows and sheep. Horse-breeding, as the table indicates, has fallen back to the 1874 level.

Size of Farms. The numbers of holdings of the various sizes in 1914 and 1931 are shown in the following summary, with, as regards the former year, particulars of the proportion of the total acreage occupied in each group :—

Size of Holding. Acres.	1914.		1931.
	Number.	Acreage % of total.	Number.
Over 300 . . .	82	6.8	70
150-300 . . .	628	26.2	553
100-150 . . .	718	18.2	715
50-100 . . .	1,564	23.3	1,605
20-50 . . .	2,311	15.8	2,160
5-20 . . .	3,476	8.2	2,668
1-5 . . .	2,381	1.6	1,654
Total . . .	11,160	100.1	9,425

In spite of Small Holdings legislation, the tendency revealed by the above statistics is for holdings of less than 50 acres to decline in numbers. Farms of over 150 acres have likewise become fewer, while those of 100-150 acres have remained stationary and the 50-100 acres size have increased. The family holding of about 100 acres is most in demand and, even in these times, a farm of this size is readily let at about £2 per acre in the lower country and £1-£1 10s. 0d. per acre in the hill districts.

Ownership. Derbyshire is a county of numerous small estates: there are few properties exceeding 10,000 acres under one ownership. On the other hand the acreage owned by farming occupiers is relatively small, viz., 68,825 acres in 1922: the figure for 1913 was 35,937. The area sold in Derbyshire just after the war, therefore, was not nearly so great as, for example, in Leicester. On the eastern side of the county the numerous colliery companies own a considerable portion of the surface, a policy doubtless connected with the problem of subsidence.

Tenancy Agreements. The annual tenancy is universal. Excepting a few holdings in the Foremarke district which have autumn entry, the general date of commencement of tenancy is March 25th. It is not usual for the incoming tenant to take possession of any part of the holding until Lady Day, but there are exceptions, e.g., on some estates right of pre-entry is given

in respect of stubbles not ploughed by February 1st. Verbal agreements are not uncommon.

Compensation for fertilisers and feeding stuffs consumed during the last two years of the tenancy is generally based on Voelcker's and Hall's tables. Liming is paid for on a varying basis, commonly 7 years on pasture and 5 years on arable land. In many cases the yard manure belongs to the tenant and frequently market price is paid for unconsumed fodder grown during the last summer. Nothing is now paid in respect of hedge-laying performed in the outgoing year.

The total sum claimed by the outgoer normally amounts to about 1 year's rent. Typically the ingoing valuation on a 100-acre farm in the Derby district would at present be round about £200. Almost invariably the amount is determined by two professional valuers, one appointed by the outgoer and the other engaged by the incomer or the landlord.

DISTRICTS.

1. *The Red Marl*, which underlies and has given rise to the soils in most of the low country south of a line from Ashbourne to Ilkeston, produces a characteristic red soil of heavy texture. Where properly drained and manured it is capable of growing enormous crops of wheat, mangold and cabbage. About a fifth of the land here is under arable cultivation, the remainder being permanent grass, which is also very productive under good treatment. Large trees, vigorous hedges, narrow winding lanes and red brick homesteads are characteristic features of the countryside. In this district, the farms are rather larger than in most other parts of the county, typically 150 acres, and rents are in the vicinity of £2 per acre. Nearly every farm is devoted to milk production, only wheat being sold off the arable land.

Derby town absorbs the milk produced from an area of about 20,000 acres or about one-sixth of the area in question. The bulk of the output from the other 100,000 acres, much of which is remote from town or railway, is collected by lorries operating from the condenseries at Ashbourne and Hatton, and the milk depots at Egginton, Brailsford, Willington and Uttoxeter.

The red marl district was, in the days when heavy horse breeding was profitable, an important centre for good blood. Harold, Lockington Beauty and Snelston Lady were all bred here, not on the limestone as commonly thought.

2. *The Coal Measures* of East Derbyshire give rise to brownish yellow sticky clay soils of somewhat sour character, but very responsive to basic slag and lime. Strips of free-

working loam occur in places and occupy a relatively large area north of Chesterfield, where fine crops of swedes and oats are grown, and a considerable portion of the land is devoted to arable cultivation. Being a thickly-populated district, there is a good local demand for milk, which is met by the smaller farmers, the larger dairies sending to Sheffield. The farms are somewhat small, from 50 to 100 acres, and rents vary from 25s. to 35s. per acre. The homesteads are built of sandstone. Colliery workings, causing the land to sink, add to the difficulties of farming the heavy soils in these parts.

3. *The Limestone country* of West Derbyshire is very characteristic; small fields bounded by white stone walls, narrow white-surfaced roads, the absence of trees and hedgerows and the general remoteness all tend to give the district a character of its own. Rugged scenery is found in places well known to tourists; but, apart from such rocky clefts, the contour is not exceptionally undulating; the limestone area is really an elevated plateau mostly between 800 and 1,200 feet above sea level.

Although cattle rearing and sheep breeding occupy a more important place on the poorer farms and more remote holdings, milk is the main product; the collecting lorries have penetrated well into the heart of the district and good herds may be found at all elevations. Much of the milk produced in this district goes to Manchester, but recently a considerable proportion has been collected by the motor lorries delivering to Ashbourne and Sheffield, and a London firm has recently established a collecting and cooling depot at Rowsley.

The farms vary considerably in size, some being upwards of 300 acres and rented at about 15s. per acre; others are small holdings; probably the average rent is about 20s. per acre for land without much daleside. The special difficulties of the country are excessive rain and shortage of water; the rainfall is nearly 50 inches in the Buxton district, much of which falls during the hay-making season; but, owing to the porous nature of the sub-strata, there are few brooks or rivers and wells cannot be utilised. Catch-water from roofs and "dew" ponds are the ordinary sources of water supply. This was the home of Bury's Victor Chief.

4. *The Magnesian Limestone* district on the opposite side of the county—east of Chesterfield—is of quite a different character. It is here that the finest arable land in Derbyshire is found, being typical sheep and barley land, laid out in large farms, with regularly shaped fields, good homesteads with characteristic red pantile roofs and provided with covered yards. Some of the finest Shire horses may be found in this locality.

5. *The Millstone Grit* forms a ridge of high-lying country along the centre of the county from Belper northwards to Glossop. In most places it serves only as a sheep and grouse moor. Its soils form poor pastures, showing brown against the fresh green that is characteristic of the limestone; nevertheless, under arable cultivation gritstone soils will produce excellent crops of swedes, potatoes and oats, where the elevation and rainfall do not render harvesting too difficult. Gritstone lends itself better to cattle rearing and sheep farming than to dairying. The Melbourne market gardens are on gritstone soils, but here both elevation and aspect are favourable, and the necessary manure is liberally applied.

The principal CATTLE MARKETS in the county are:—

Derby—Tuesdays, fat stock; Fridays, stores.

Bakewell—Mondays weekly;

Chesterfield—Saturdays, weekly; and

Ashbourne—Thursdays, fortnightly.

Smaller markets are held at Alfreton, Belper, Buxton, Chapel-le-Frith, Hope and Wirksworth. A number of fairs, more especially for the sale of sheep and store cattle, are also held in the autumn at various centres. Derby is one of the largest markets in the country for dairy cows and calves.

Of AGRICULTURAL SHOW SOCIETIES there are three large and several smaller bodies. The Derbyshire Agricultural and Horticultural Society, which holds an annual exhibition in Derby on a day in July or August, has a membership of about 600. The Bakewell Farmers' Club's Annual show early in August has in recent years been very successful, attracting an attendance of over 20,000. The Chesterfield and East Derbyshire Agricultural Society, like the County Society, has recently had a succession of wet days, which have affected the "gates" and the financial results. Farm Competitions are organised by the Derbyshire and the Chesterfield Societies. There are two MILK RECORDING SOCIETIES in the county, the Peak and the Derby District.

The Derbyshire Branch of the NATIONAL FARMERS' UNION has its headquarters in Chesterfield, where a branch organisation existed for several years before the movement extended to South Derbyshire. To-day the Derby district branch, with upwards of 800 subscribing members, is the strongest of the local organisations, Chesterfield having 300, Alfreton 160, Belper 125, Bakewell 100, while Ashbourne, Ashby, Burton, Buxton, Dronfield, Eckington Heanor and Ilkeston branches have each nearly 100.

AGRICULTURAL DISCUSSION SOCIETIES are in existence at Ashbourne, Alfreton, Bakewell, Derby, Chesterfield, Glossop,

Heath and Tideswell. These societies, which have grown up out of the County Agricultural Classes, hold monthly meetings at which are read and discussed papers dealing with definite technical farming problems rather than with political or similarly contentious matters. There is no doubt that such societies have a high educational value, not only in bringing the results of research and reflection before the members, but also in the interchange of experiences and views which the discussions promote.

The centre for AGRICULTURAL EDUCATIONAL WORK in Derbyshire is the County Agricultural Institute, in St. Mary's Gate, Derby. The building itself, which was erected in 1927 with the aid of a grant from the Ministry of Agriculture, is accessible either from St. Mary's Gate or from the old Bank Yard, Irongate. It is equipped with lecture rooms, laboratories for milk testing, analysis, veterinary and other bacteriological work, and the requisite administrative offices.

The staff of the Institute are at the service of every farmer in Derbyshire who wishes to consult them on any farming problem; and farms, gardens and poultry establishments are visited on invitation for the purpose of advising on the spot.

The staff comprises not only agricultural experts, but also experts in Veterinary Science, Horticulture, Poultry Keeping and Dairy Work. Three of the agriculturists are stationed outside the County Town at Ashbourne, Buxton and Chesterfield respectively.

Day Classes for young farmers are conducted at three local centres in the winter and corresponding courses for farmers' daughters are run in the summer. Other activities include evening lectures, field demonstrations, classes in hedge-cutting and ploughing, and the issue of a monthly magazine, "The Derbyshire Farmer."

The County Poultry Station at Little Eaton accommodates 250 birds, and here an officially recognised laying trial is conducted.

The County Council also has an interest in the Midland Agricultural College at Sutton Bonington, where residential courses of instruction are provided for suitably educated young persons who are able to devote one or more years to agricultural studies.

J. R. BONE

County Agricultural Institute,
St. Mary's Gate, Derby.

REPORT OF THE RESEARCH COMMITTEE.

THE Society, through its Research Committee, has continued to assist agricultural research by means of several financial grants, and the Committee is satisfied that the expenditure is proving productive of valuable results. In the following Report they have summarised the more important developments of the past year.

I.—WORK COMPLETED.

Two investigations have been completed and the full Reports of the investigators are appended. The first of these, on "The Loss of Lime from Light Soils," by Dr. E. M. Crowther, summarises the experimental results obtained at Woburn on this subject. It is anticipated that further papers of importance to the farmer will result from the examination of the Woburn data, which is being carried out by the staff of the Rothamsted Experimental Station. The second by Mr. F. Rayns deals with the results of bullock feeding experiments, carried out over four successive years at the Norfolk Agricultural Station, comparing the feeding value of sugar beet tops with that of roots.

II.—WORK IN PROGRESS.

ROTHAMSTED EXPERIMENTAL STATION.

WORK ON THE INOCULATION OF LEGUMES, 1932.

The search for a more vigorous strain of the lucerne organism is still continuing, so far without success, though some inferior strains have been found. It is, however, important to continue the search because it is highly probable that the best strain has not as yet been discovered.

It is found that the different strains of the nodule organism are not fixed: a strain which has remained unchanged for a long while may suddenly break up into a number of new forms, some of which reproduce the parent form while others do not. The mode of entry of the organism into the root is being studied. After lucerne has come up there is a period of slow growth during which the young plant runs the risk of being smothered with weeds. So far no way of avoiding this danger is known. Dressings of nitrogenous fertiliser, which could be used for a non-leguminous crop, do not answer with lucerne because they interfere with the inoculation. When more is known about the relation of the organism to the plant it may be possible to help the plant over this critical stage without damage to the organism.

The process of infection is found to be very complex. As soon as the young plant puts forth its true leaves it exudes from its roots some substance which stimulates the multiplication of the bacteria. The bacteria in turn excrete something which causes the root hairs to bend, so straining the cell-wall at the bend. At this weak point the bacteria enter and work their way up to the place where they make the nodule. When a nitrogenous manure is given to the lucerne to stimulate its growth, the nitrate soon formed, while not preventing the formation of the bacterial secretion, stops it from bending the root hairs; hence the bacteria cannot enter and the inoculation fails. We are left, therefore, with the difficult problem of finding some other way of shortening this "dead slow" period of growth.

Considerable progress is being made with clover inoculation. Strains of organisms are being collected from America, Holland, Germany and Sweden and compared with ours to see whether any of these is more efficient than ours. In conjunction with Prof. Stapledon experiments are being started on some of the Welsh hill pastures which, if successful, will open the way to the use of inoculation there.

EXAMINATION OF THE WOBURN DATA.

This work has progressed so far that it will probably be completed by March, 1933. The account of the fifty years of experiments is now being written up: it will form a fair-sized book which will, it is hoped, be ready during the summer.

Five main lines of work have been followed up:—

(1) *Maintenance of Fertility on Sandy Soils in Arable Cultivation.*—Of all the schemes of manuring tested the only one that has maintained the fertility of the soil has been the addition of farmyard manure supplying on the average 130 lb. nitrogen annually per acre (about 8 tons of manure). This has not increased either the carbon or nitrogen in the soil, and there is no evidence that it has increased the fertility, but, on the other hand, there has been no deterioration in the yields of either wheat or barley. The decomposition of the farmyard manure is very rapid: this loss of 130 lb. nitrogen per acre per annum is very high.

No scheme of artificial manuring kept up the fertility: the losses both of nitrogen and carbon from the soil were considerable. The crop results show a soil deterioration on all plots, which, however, is least when complete artificials including nitrate of soda are given. Certain differences are found according to the types of artificials and according as the crop is wheat or barley.

These results are in marked contrast with those obtained on the heavy land at Rothamsted. Here farmyard manure, applied annually, has enriched the soil in both carbon and nitrogen, and some of the mixtures of artificial manures have maintained the nitrogen content of the soil, though none have increased it.

(2) *Green Manuring*.—The failure of both mustard and vetches to increase fertility has been traced to the rapid decomposition of the plant material soon after it is ploughed under. The process is exactly parallel to that occurring where farmyard manure is ploughed under, and the losses are in both cases high.

(3) *Residual Values of Manure*.—No evidence can be found of any important residual values of farmyard manure or green manure, and it seems clear that for light soils the ordinary rules for valuation may inflict considerable injustice upon incoming tenants. This subject urgently needs more investigation.

(4) *How Long Does Lime Last in a Sandy Soil?*—The results show that the length of time during which lime lasts in the soil depends very much on the way of adding it. A given amount of lime applied in small doses at intervals of a few years suffers less loss than the same quantity of lime applied in one large dressing. Details of the rate and mechanism of the loss are being worked out. This subject is discussed at length below (see p. 199).

(5) *Influence of Weather Conditions on Yield and Composition of Crop*.—Although the variation in yield from year to year is considerable, the actual rainfall does not play anything like so large a part in the variations of yield of either wheat or barley from year to year as might have been expected. Also the rainfall effect on the farmyard manure plots seems to be very similar to its effect on the artificially manured plots so long as they are not too acid. Some other climatic factors are apparently more important than rainfall, but as yet it is not clear what they are.

On the other hand, the amount and distribution of the rainfall profoundly affects the nitrogen content of the barley grain. The relationship has been worked out, and it is now possible to forecast at the end of June the percentage of nitrogen in the grain that will be reaped some weeks later, and the forecast and the actual results agree very closely. Attempts are now being made to improve the prediction by taking into account the changes in temperature also.

MASTITIS IN COWS.

Research work on Mastitis has been continued at the Research Institute, Royal Veterinary College, London, during the year 1931–32, and the following progress report has been presented by Dr. F. C. Minett:—

The Different Forms of Mastitis and their Bacteriology.—In last year's Report to the Research Committee of the Society (Ref. 1) reference was made to the importance of obtaining precise information regarding the different kinds of bacteria which are responsible for disease of the cow's udder. This study is not merely of academic interest because, unless there is some means of identifying such bacteria and of distinguishing those which are capable of producing disease from those which are not, it is impossible to give serious attention to such practical problems as the manner in which udder disease spreads, the severity of the infection and measures of control by vaccination or in any other way. This being so, much intensive work has been carried out during the past year on the bacteriology of mastitis, and in order to derive full advantage from this study the results have been considered in relation to the symptoms and course of the disease in affected animals. It is now for the first time clear that mastitis streptococci (which are the bacteria principally concerned) can be divided, in respect of their manner of growth in artificial culture media and of the chemical changes they set up in such media, into three distinct groups; these, for the purpose of description, have been called Groups I, II and III. To these must be added yet another group of streptococci which, although they occur less frequently, are of great importance because they have been proved to be indistinguishable from certain streptococci from human beings. An account of these findings was embodied in the last Report of the Committee.

It is unfortunate in a sense that the matter does not end there. For a number of years bacteriologists have been in the habit of employing so-called serological methods for the purpose of displaying slight, but important, differences within bacterial species. This has led to a large increase in useful knowledge, but taking as a relevant example the streptococci of animals, little has been done. During the past year serological methods have been applied to mastitis streptococci in a large series of experiments, and particularly to those belonging to Group I. In consequence, it has been found that this group can be subdivided into not less than three main sub-groups or so-called types. The practical importance of these findings is now being investigated.

Workers in the past have devoted attention almost exclusively to the streptococci designated by us Group I, because it is these which are responsible for a form of mastitis which is widely prevalent among milking cows. This form is essentially chronic in its course and there is good reason for believing that it is chiefly spread through the agency of the milker. It has often been remarked by observers in the field, however, that

mastitis is not invariably chronic in its course, but may sometimes be quite acute. It can be said that in spite of an extensive literature on the subject of mastitis there is nothing to show that the real significance of such differences has been properly appreciated. It is known that acute relapses sometimes appear during the course of an essentially chronic infection caused by Group I streptococci, but our researches have shown that acute attacks are not infrequently dependent upon the presence of an entirely different variety of streptococcus, namely that which we have called Group II. Group II infections, although less common than those due to Group I, may at times assume great importance in practice, because the changes in the gland may be so acute that the affected quarter is rapidly destroyed. At other times the attack, although acute in nature, is comparatively mild and rapidly yields to thorough and repeated milking, so that subsequent bacteriological examination of the milk may no longer reveal streptococci. Group II infections appear to be derived from some other situation within the animal body, possibly from the uterus, and, so far as our observations have gone, this form shows no tendency to spread by contagion.

In our experience disorders due to streptococci of Group III are mild and transient and cannot as a rule be detected without making an examination of the milk in the laboratory.

A full account of our original researches on the classification of mastitis streptococci and their relationship to the different forms of the disease has been published in the *Journal of Comparative Pathology and Therapeutics* (Refs. 2, 3, 4).

Diagnosis.—A good deal of time has been devoted to the problem of diagnosing those cases of mastitis which are not readily detected by an ordinary clinical examination of the animal. Unfortunately, laboratory methods which are available for diagnosing such cases may prove to be somewhat laborious for large-scale routine work. Efforts are, therefore, being directed, firstly, to ascertain the extent to which it is necessary to resort to the laboratory for guidance and, secondly, towards simplifying the laboratory procedure required. With regard to the second point, an artificial culture medium has been developed which promises to be of immense value in two ways. Not only does this medium inhibit the multiplication of certain harmless bacteria which are present in udder milk, sometimes in large numbers, but also it enables certain other harmless bacteria and Group III streptococci to be differentiated from Groups I and II. Further, up to a point, the medium permits a distinction to be made between Groups I and II.

Prevalence and Economic Importance.—In previous Reports to the Research Committee it has been pointed out that the

main underlying cause of the serious economic loss due to mastitis is the high prevalence of the disease. One of the chief factors involved is an actual diminution of the total milk yield. In order to procure information of statistical value on this point, the recorded yields of cows in several suitable herds are now being examined. Further comment on this matter is reserved until sufficient data have been analysed.

Control.—Control measures inaugurated in 1929, involving the detection of cases which are not readily manifest, combined with the milking of all infected cows last, are being continued in six herds. Milk samples from the presumably healthy sections of these herds are submitted to laboratory examination at regular intervals of three months. Up to a point, the results are encouraging and show beyond question that the incidence of chronic streptococcus mastitis, *i.e.*, Group I infections, can be greatly reduced by these measures. In one small self-contained herd Group I streptococci have not been encountered since March 1931, and this goes to substantiate the working hypothesis that chronic streptococcus mastitis is spread by contagion from cow to cow. In general, it has been found, as would be expected, that it is more difficult to prevent spread in herds where the original incidence of infection was high and where most of the initially infected cows are allowed to remain on the premises.

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3. *Ibid.* Vol. 45, p. 43. "Studies on Bovine Mastitis. VI. The non-haemolytic streptococci of bovine mastitis and their relationship to certain saprophytic streptococci from cattle." By S. J. Edwards.
4. *Ibid.* Vol. 45, p. 185. "Studies on Bovine Mastitis. VII. The Serological Characters of Mastitis Streptococci." By A. W. Stableforth.

DISPOSAL OF SUGAR BEET BY-PRODUCTS.

It seems probable that the survival of the beet industry in Britain will depend largely upon the success of the farmer's efforts to fit the beet crop into his general scheme of farming. This problem is bound up with others, such as the winter feeding of stock upon a reduced area of roots, the maintenance of the fertility of the land and the economic disposal on the farm of the by-products from the crop.

The investigation of these problems has been continued at the Norfolk Agricultural Station during the past year, under the following headings:—

1. The feeding value of beet tops in comparison with roots :—

- (a) when fed to bullocks ;
- (b) when fed to sheep.

2. The manurial value of beet tops :—

- (a) when fed to sheep ;
- (b) when ploughed in.

3. The feeding value of wet pulp in comparison with roots when fed to bullocks.

Interim results of the experiments are given below, but it should be remembered that with the exception of the bullock feeding trial dealing with beet tops and roots, they are from two years' trials only, and hence they must not be taken as being universally applicable without at least another year's confirmation.

1. (a) *The Feeding Value of Beet Tops for Bullocks.*—A full report of this aspect of the work will be found on page 214.

(b) *The Feeding Value of Beet Tops for Sheep.*—Two years' trials with fattening hoggets have been carried out, comparing beet tops with swedes. These two foods were fed in quantities calculated to give equal feeding values, with a common basal ration of hay and concentrates. The period of feeding in each year was approximately eight weeks—from the end of November to January. Live weight gains were recorded and so far the swedes show a marked superiority over the beet tops. In the two years' trials the beet tops gave an average live weight gain per head of 2 lb. per week, as against just over 3 lb. per head per week given by the swedes. Thus it would appear that the feeding value of the tops for fattening hoggets is only about two-thirds that of swedes. Moreover, there are indications that this difference is greater after the turn of the year, when the beet tops rapidly deteriorate in feeding value.

2. *The Manurial Value of Beet Tops* (a) *When sheeped* and (b) *When ploughed in.*—In addition to the sheep feeding trial, a further experiment is being carried out to determine the manurial values of beet tops and of swedes when folded with sheep. At the same time the manurial value of the tops when ploughed in is also being determined.

The manurial value is being measured by the yield of the barley and succeeding crops throughout a rotation. In order to ensure that an actual response to the manuring is being obtained control plots are included from which the tops have been carted off and which have received no further treatment. The results of the first trial, which was put down in the winter of 1930–31, are available only for the barley and the following hay

crop. With both crops there was a definite response to the manuring, whether in the form of sheep folding or from ploughing in tops. It would also seem that the manurial value of folded beet tops is higher than that of folded swedes, for the former have resulted in higher yields both of barley and of hay than the latter.

A similar experiment was put down in the winter of 1931-32 and so far only the results of the following barley crop are available. The figures, however, confirm those obtained the previous year, and there was again a heavier yield where tops were folded than where swedes were folded.

A further experiment on the same lines is being put down this present winter, the object of this repetition being to minimise any variations in manurial values that may be due to seasonal effects. It may be added that in each year two experiments were laid down, one in which the sheep folding and ploughing were done in November, and the other in which the sheep folding and ploughing were done in January. This was done because it seemed possible that the manurial values might vary according to the time of sheeping. So far, however, there is no evidence to show that the relative manurial values differ according to the season at which the folding is done.

3. *The Feeding Value of Wet Pulp for Bullocks.*—The general practice of British Beet Sugar Factories is to dry the beet slices after sugar extraction and to sell the residue as dried pulp. There is, however, a growing tendency to reduce the amount of drying and to offer at a low price a larger quantity of the wet pulp which is being used at conveniently situated farms in Norfolk and Suffolk for stock feeding.

The low price of this wet pulp makes it attractive to stock feeders, but there is little information available as to its feeding value in comparison with roots, or as to the possibility of ensiling it, with the view to feeding when fresh supplies are not available.

In order to investigate these points, a bullock feeding trial is being carried out during the present winter, with a view to comparing both the fresh wet pulp and the ensiled pulp with roots as foods for fattening bullocks in yards. Not only is it essential that the wet pulp should keep the animals "doing" satisfactorily, but the pulp and more especially the ensiled pulp, must result in a carcase of good quality beef.

This trial is an addition this year to the comprehensive programme of investigations into the value of sugar beet by-products, which the Research Committee has been carrying out in conjunction with the Norfolk Agricultural Station.

EXPERIMENTS IN HAMPSHIRE.

The programme of experimental work described in the last Volume of the Journal (pp. 264-267) is being carried out. A certain number of crop failures have occurred and other difficulties have been encountered, but there will probably be sufficient data, when all has been collected and analysed, to furnish guidance on a number of important questions. Meanwhile the following interim reports and tentative conclusions have been submitted by the County Organiser.

1. *Experiments to investigate the effect of Sheep Folding and of other methods of maintaining fertility on light land, with particular reference to a corn growing system.*

The experiment was commenced at three centres in 1931 and at four in 1932. In general quite satisfactory yields were obtained by the use of artificials alone, on plots whence the root crop had been carted off. On the other hand the ploughing in of straw, either in conjunction with the feeding off of the root crop or in conjunction with artificials, has shown no consistent increase in yields. In certain cases indeed the application of straw appears to have depressed the yield.

2. *Experiments on Lucerne.*

Plots of lucerne, with different manurial dressings and different nurse crops, were sown at four centres in 1931 and four in 1932. In general the plots that received dressings of complete artificials, or of phosphates and potash, have proved markedly superior to those receiving only phosphates, or only potash, or no manure. Exceptions have been noted in cases where the cereal nurse crop was very heavy, and lodged, as a consequence of the complete artificial dressing. Rape as a nurse crop has on the whole produced a stronger plant than a cereal nurse, but in certain cases the benefit has been balanced by the greater development of weeds on the rape plots. The cutting of the cereal nurse crop early in the season (green) has not proved universally advantageous to the lucerne plant. The combination of cocksfoot or Italian ryegrass with lucerne has undoubtedly had a beneficial effect in suppressing weeds, but in certain cases the grasses have competed too successfully with the lucerne itself.

3. *Green Manuring Experiment with Trefoil.*

This experiment was laid down at one centre in 1931 and at seven centres in 1932; but only in two instances was a really successful plant of trefoil obtained. No results will be available until after next harvest.

III.—“THE FARMER’S GUIDE TO AGRICULTURAL RESEARCH IN 1931.”

The annual review of the research work of the year in the principal branches of agricultural science and economics, prepared under the direction of the Committee, was issued in December. The Committee decided on the change of title with the idea of making clearer the purpose that the publication is intended to serve. The distribution to members making application and by sales amounted to upwards of 4,000 copies.

An article by Mr. J. C. F. Fryer on “Pests and Parasites” replaced the one on “Crops and Plant Breeding” this year. Professor A. W. Ashby contributed that on Farm Economics. Otherwise the subjects dealt with and the panel of contributors was the same as for the previous year. Mr. C. S. Orwin continues to edit the volume.

IV.—MEDAL AND PRIZE FOR ORIGINAL RESEARCH.

Essays were submitted for the Medal and Prize offered annually by the Society for original research. Sir John Russell and Mr. William Burkitt kindly acted as adjudicators, while Prof. F. A. E. Crew of Edinburgh and Dr. E. M. Crowther of Rothamsted assisted respectively in two cases. On their advice the Committee resolved not to recommend the award of the medal.

THE LOSS OF LIME FROM LIGHT SOILS.

(AN EXAMINATION OF THE WOBURN BARLEY AND WHEAT SOILS.)

THE history of the continuous barley and wheat plots at the Woburn Experimental Station from their inception in 1876 down to the present day affords a striking parallel to the general experience of farmers on light land. In the last few decades of last century liming received little attention either at experiment stations or on ordinary farms, and many farmers are now being handicapped by the resulting lime deficiencies in their soils.

The original plan of the Woburn experiments was drawn up by Sir John Lawes and Dr. Augustus Voelcker, with the object of ascertaining how far the results of the Rothamsted continuous experiments would be repeated on a light soil. Twenty-two plots were considered sufficient for the necessary tests on fertilisers and farmyard manure and no provision was made for testing the effects of lime. The early yields were

somewhat unexpectedly high, but, as is now well known, there was a catastrophic failure of the barley on the sulphate of ammonia plots after about twenty years, and a similar though less complete failure of the wheat a few years later, especially where no mineral manures were used. The liming of halves of the affected plots restored the fertility, and from time to time many other sub-divisions were made to test liming questions. Ultimately no less than seventeen additional sub-plots were introduced by Dr. J. A. Voelcker in order to study lime questions alone, and the field became one of the classical illustrations of the effects of soil acidity and liming. When, in 1927, the treatments were interrupted for fallowing, soil samples were drawn from every sub-plot for laboratory studies on the fate of the added lime and the extent of the acidity; and further samples were taken in 1932 as an additional check. Some of the conclusions from both series of analyses will be considered in this paper (Ref. 1), but, before presenting them, it is of interest to examine the question why, both in experimental stations and in general farm practice, liming received so little attention fifty years ago.

The old chalk-dells and abandoned lime-kilns throughout the country testify to the importance attached to chalking and liming in bygone days, and old writings show that the art of liming was well understood. At the end of the eighteenth century one of the earliest applications (Ref. 2) of chemical analysis to soils provided a means for measuring reserves of calcium carbonate and for detecting serious lime deficiencies, but there is no evidence that it was used. Farmers knew without chemical analysis when and how to lime and they had the materials and labour available to meet their needs. They did not, however, know how to make efficient use of the artificial fertilisers introduced about the middle of the nineteenth century and the early investigations of Lawes and Gilbert, Augustus Voelcker and others were, therefore, concentrated on problems of plant nutrition more or less directly relating to the use of fertilisers.

In studying the loss of plant food in drainage waters in 1868 A. Voelcker (Ref. 3) showed that ammonium salts increased the annual loss of calcium. In discussing his results Lawes, Gilbert and Warrington (Ref. 4) wrote in this Journal that "the action of ammonium salts in impoverishing a soil of lime and magnesia should always be borne in mind when their application to soil poor in lime is in question." They do not, however, appear to have considered the possibility that both in general practice and in their own experimental fields the loss of lime might be allowed to proceed so far as to jeopardise the crop and annul the effects of the fertilisers. They appear to have treated liming as

they did ploughing, cleaning and draining the land; they assumed that all were normal operations of good husbandry, needing no special study in laboratory or experimental field.

On many light soils the large reserves of calcium carbonate built up in the first half of the nineteenth century began to run out towards its end and the example of the Woburn plots made it possible to identify many crop failures in terms of lime deficiency. Unfortunately the old remedies were no longer easily available; the local quarries and kilns had decayed and transport and labour costs had risen. Farmers now turned to the chemist for advice on liming as well as on fertilisers, and asked whether they should lime, how much they should use, and how often they should repeat the dressings in order to avoid the repetition of crop failures.

The problem proved to be by no means simple, for it was found that many fertile soils contained no calcium carbonate. It was clearly unnecessary, therefore, to use sufficient lime or limestone to build up large reserves as in the past. Further, the soil acids themselves proved to be unusual in composition and extremely difficult to measure. The subject of soil acidity grew to occupy a large proportion of the journals on agricultural science. Field trials on liming did not keep pace with the growing interest of the subject both in the laboratory and on the farm, for liming trials need several years and are, therefore, more difficult to conduct than simple single-year tests on fertilisers. The Woburn continuous wheat and barley plots thus acquire a special interest for liming studies, even though they suffer from the fact that they were not originally planned for this purpose, and received lime treatments in irregular amounts and at different times.

It is of interest to recall that the modern methods of distinguishing between the active lime in soils and the inert material locked away in unweathered minerals developed out of the study of the phenomenon of "base exchange," which was first examined by Way (Ref. 5), a Royal Agricultural Society's chemist. Way showed that a solution of common salt, in passing through a column of soil, exchanged some of its sodium for calcium from the soil. The full significance of this observation was overlooked for many years until Gedroiz, in Russia, Hissink, in Holland, and Kelley, in America, showed that the total amount of calcium extractable from the soil in this way was a well-defined quantity which could be taken to measure the active lime of the soil. Way drew an analogy between the base exchange in soils and that in certain crystalline zeolites, but he failed to isolate corresponding bodies from the soil. During the last few years it has been possible to show with the aid of X-rays

that base exchange in the mineral part of the soil is in fact due to certain crystalline clay compounds of sub-microscopic size. Humus also has important base exchange properties.

The total amount of lime extractable by a salt solution is generally known as the "exchangeable calcium," and it is this material rather than the calcium carbonate which controls the acidity of the soil. Calcium carbonate acts as a reserve and, so long as any appreciable amount of it remains, it bears the loss of calcium as bicarbonate in the drainage waters. When no reserve of calcium carbonate remains, the clay and humus lose exchangeable calcium and, as acid hydrogen takes the place of exchangeable calcium, the soil becomes progressively more acid. It is convenient to think of a soil as possessing a definite saturation capacity or power of holding lime, which increases with its content of clay material and humus. A soil with an adequate reserve of calcium carbonate may be taken as fully saturated; acid soils are unsaturated. The intensity of the acidity and the general effects on plant growth depend on the *percentage* of unsaturation, but the amount of lime needed to correct the acidity depends on the actual *amount* of unsaturation which is sometimes but not very happily known as the "lime requirement." Thus, if a light, sandy soil without calcium carbonate loses one ton of lime per acre it will become highly unsaturated and crops may fail; whereas a heavier soil, or one with more organic matter, can lose this amount with a much smaller proportionate change and the crops may not suffer. When, on the heavy soil, the loss of lime ultimately reaches the critical degree of unsaturation, a small dressing of lime will be insufficient to correct the acidity, though an equal dressing would suffice for a light soil at the same intensity of acidity or percentage saturation. The confusion of these two aspects—"intensity" and "quantity"—of acidity formerly caused considerable difficulty in applying chemical analysis to liming and in interpreting the experience of farmers. Where a chemist has considerable experience of the type of soil analysed he can make satisfactory allowances for the second factor, after measuring the first; and it is for this reason that advisory chemists and county organisers have been able to be of great service to farmers in liming problems. Their work would be still more valuable if they had a number of trials on different amounts of lime with which to standardise their methods.

In comparisons on a single field of fairly uniform texture it is sufficient to measure either the amount of exchangeable calcium or the amount of unsaturation. The former will be used in the present paper, but another measure, which is related to the percentage saturation, will be added to the tables for reference without detailed discussion. This is the "pH value" which is

essentially a measure of the intensity of the acidity. For purely theoretical reasons it is commonly expressed on a scale which gives 7 to 8 for soils with reserves of calcium carbonate, about 6 for soils with occasional failures of the more sensitive crops in dry districts or in dry spells, about 5 for soils on which failures of lucerne, sugar beet, and barley are common and, finally, about 4 for extremely acid heaths and moorland.¹

Since soil acidity arises essentially from the washing out of calcium and since both the original calcium carbonate and the underground drainage channels are naturally irregular, it is easy to understand why acid soils should be notoriously uneven. Comparisons of single plots are, therefore, liable to lead to serious errors from soil irregularities, even where the actual samplings and analyses are carefully performed. The remedy in new experiments is to have a large number of plots for each lime treatment, but this is impossible for the old Woburn experiments and the discussion will, therefore, be restricted as far as possible to comparisons based on a number of plots with similar if not identical treatments.

The results of the analyses for exchangeable lime will be expressed, for ease of comparison with the amounts of lime added, not as percentages of the weight of soil, but as tons of calcium oxide per acre to a depth of 9 (or 18) inches. It was found about the middle of the experiment that 1 acre of soil to 9 inches weighed about 1,400 tons both in the surface and subsoil and this factor will be used throughout the present paper. (It should be noted that it is customary in similar calculations to allow only 1,000 tons per acre of surface soil as being simpler and also closer to the average ploughing depth.) As no other form of soil calcium but the exchangeable calcium, and no other area but an acre will be considered, it will avoid tedious repetition to refer to "tons CaO in the surface soil," meaning "tons of exchangeable lime (CaO) per acre to a depth of 9 inches."

It is unnecessary here to discuss the plot yields in detail, for they were given annually in this Journal until 1920 and subsequently in the Rothamsted Reports. A general summary (Ref. 6) by Dr. J. A. Voelcker appeared in 1923 and a more detailed one is in the course of preparation. The essential features of the fertiliser treatments, the crop yields and the exchangeable lime contents of the soils at four periods are given for some of the major plots in Tables I and II. It should be noted that the initial rates of fertiliser applications were by no means excessive and also that they were greatly reduced after 1905. Over the fifty years the average annual application of sulphate of ammonia was 1.4 cwt. per acre. The fields were fallowed in 1927 and 1928 and then cropped without any fertiliser applications.

¹ See also the article by Mr. Morley Davies in this Volume, p. 3.

(except in 1931 and 1932 on a few barley plots not included in Table II).

TABLE I.

RATES OF APPLICATION OF FERTILISERS AND MANURES.

	Cwt. per acre per annum.		Tons per acre in
	1877-1906.	1907-1926.	50 years. 1877-1926.
<i>Nutrients.</i>			
Nitrogen (in fertilisers) . . .	0.37	0.18	0.74
Nitrogen (in dung) . . .	1.48	0.74	2.96
Phosphoric acid . . .	0.56	0.48	1.32
Potash . . .	0.89	0.25	1.59
<i>Fertilisers.</i>			
Sulphate of ammonia . . .	1.8	0.9	3.6
Nitrate of soda . . .	2.3	1.2	4.6
Superphosphate . . .	3.5	3.0	8.2
Sulphate of potash . . .	1.8	0.5	3.2
Sulphate of soda . . .	0.9	0.0	1.4
Sulphate of magnesia . . .	0.9	0.0	1.4
	Tons.	Tons.	
<i>Dung</i>	7	4	about 300

The yields in Table II show that at the beginning of the experiment the land was of high fertility and that full dressings of artificial fertilisers gave higher yields than dung. Apart from the complete failure on the ammonium sulphate plots, the yields show a steady decline which is least on the plots with farmyard manure. Immediately after the two-years' fallow the yields recovered even in the absence of fertilisers, but they fell back again in the subsequent years. One soil sample taken in 1876 from three points between the barley and the wheat plots is available, together with 14 samples taken in 1888 and 8 taken in 1898. The soil at the beginning of the experiment had 3.3 tons exchangeable CaO per acre in the top 9 inches; on the sulphate of ammonia plots about one-half of this was lost in twenty-two years and about five-sixths in fifty years. Rather more than half of the original lime remained after fifty years on the plots without nitrogenous fertiliser, and about two-thirds on those with either nitrate of soda or farmyard manure.

The general parallelism between the loss of yield and the loss of lime does not in itself prove that increasing lime deficiency was the direct cause of the loss of fertility. There were other losses from the soils. Thus plots with dung every year kept their original organic matter contents but those without dung lost in fifty years more than one-third of their original supply (1.5 per cent. of carbon and 0.15 per cent. of nitrogen in 1876). The direct effect of lime deficiency, at any rate when induced by sulphate of ammonia, is shown by the increased yields and increased lime contents after liming the sulphate of ammonia

TABLE II.

	Plot No.	Average annual yield in bushels per acre.			No Manure. 1929 1930-2	Exchangeable lime in tons CaO per acre in 9".				pH value ^a average of 1927 and 1932.			
		Heavy Manuring. 1877-86 1887-96 1897-06				Light Manuring. 1907-16 1917-26							
<i>Barley.</i>													
No Nitrogen or Minerals	1 & 7	25	18	12	10	8	20	8	2.7	2.6	1.5	1.6	5.5
Minerals only	4A	23	22	16	13	10	21	10	2.2	2.0	1.9	1.4	5.7
Sulphate of Ammonia	2A	39	28	4	0	1	3	0	2.6	1.9	0.4	0.5	4.4
" " and Minerals	5A	43	35	7	3	5	6	1	2.1	1.4	0.6	0.5	4.6
Sulphate of Ammonia (Limed ¹)	2B & 2BB	—	—	21	16	9	22	7	—	—	1.9	2.1	5.8
" " and Minerals (Limed ¹)	5B	—	—	34	20	13	24	11	—	—	2.4	1.8	6.0
Nitrate of Soda	3B	40	31	24	15	11	27	8	2.9	—	1.9	2.0	5.7
" " and Minerals	6	46	41	35	20	17	31	10	2.8	—	2.1	2.0	5.8
Farmyard Manure	11B	40	39	37	31	26	35	15	3.0	—	2.5	2.1	5.8
<i>Wheat.</i>													
No Nitrogen or Minerals	1 & 7	17	14	10	10	7	10	3	2.9	2.7	1.7	1.8	5.6
Minerals only	4	18	13	8	9	8	18	6	2.8	2.4	2.4	2.3	5.9
Sulphate of Ammonia	2A	25	22	9	1	1	0	1	2.4	1.6	0.5	0.4	4.6
" " and Minerals	5A	32	29	24	16	9	11	7	2.1	1.7	0.7	0.9	4.9
Sulphate of Ammonia (Limed ¹)	2B	—	—	17	16	8	1	6	—	—	0.9	1.2	5.0
" " and Minerals (Limed ¹)	5B	—	—	—	22	13	13	5	—	—	1.7	1.6	5.6
Nitrate of Soda	3B	34	23	17	15	13	10	4	3.1	—	2.0	2.0	5.7
" " and Minerals	6	32	30	24	18	16	13	7	2.7	—	2.1	1.9	6.0
Farmyard Manure	11B	27	28	24	20	18	21	9	3.3	—	2.4	2.0	6.1

¹ Rates of liming. Barley plots. 2 tons CaO per acre in 1897 and again in 1905 or 1912.

Wheat plots. Without minerals, 2 tons CaO per acre in 1897.

With minerals, 1 ton CaO per acre in 1905.

^a The pH values include some corrections to those given in *J. Agric. Sci.*, 1931, Vol. 21, p. 689.

plots ; and it will be noted that the effects of 2 tons of lime in 1897 repeated in either 1905 or 1912 are still apparent in 1932. Fortunately, additional plots not included in Table I may be used to examine the question as to what proportion of the added lime is still in the soil many years later.

TABLE III.

TREATMENT.	No Nitrogen A	Sulphate of Ammonia.			Nitrate of Soda. E	Farm- yard Manure. F
		No lime. B	Light liming. C	Heavy liming. D		
<i>No. of plots averaged</i>	6	8	7	6	8	2
<i>Exchangeable lime (tons CaO per acre)</i>						
1927 Surface+Subsoil 0-18"	3.88	2.41	3.31	4.25	4.30	4.56
1927 Surface 0-9"	1.82	0.64	1.14	2.06	2.06	2.45
1932 Surface 0-9"	1.75	0.66	1.17	1.89	1.91	2.05
1927 Subsoil 9-18"	2.08	1.78	2.18	2.20	2.25	2.12
<i>pH Values.</i>						
1927 Surface 0-9"	5.7	4.7	5.1	5.9	5.9	6.1
1932 Surface 0-9"	5.6	4.8	5.1	5.8	5.7	5.8

RECOVERY OF ADDED LIME.

Table III gives the average lime contents in 1927 and in 1932 of the following groups of plots : (a) six without nitrogenous fertiliser ; (b) eight with sulphate of ammonia without lime ; (c) seven with sulphate of ammonia and light dressings of lime ; (d) six with sulphate of ammonia with heavy dressings of lime ; (e) eight with nitrate of soda equivalent to the sulphate of ammonia in other groups ; and (f) two with farmyard manure. To secure the most representative averages the appropriate wheat and barley plots and the "minerals" and "no minerals" plots have been averaged. Samples were not taken at definite periods after liming and it is not possible, therefore, to measure directly the rate of loss of lime. In Table III both the light and heavy dressings were given on the average about twenty years before the soil sampling of 1927. The total lime found down to 18 inches in 1927 probably gives the best measure of the lime recovery, for there is some evidence that the relative amounts of lime in the surface and the subsoil depend on the interval that has elapsed since the last liming.

With light limings (averaging 1.36 tons lime per acre) two-thirds of the added lime was recovered in the top 18 inches of soil

in 1927, twenty years after application, whilst with the heavy dressings (4 tons per acre) only about one-half was recovered. The results in Table III show that all of the treatments, other than sulphate of ammonia without lime, give similar lime contents in the subsoil. The light limings sufficed to return to the subsoil the small amount of lime removed by the sulphate of ammonia and the excess lime from the heavier dressings was washed further down well beyond the reach of plant roots. The rate of loss of lime depends on the amount actually present in the soil. In the interval 1927 to 1932, when no manures were applied to most of the plots, the soils with less than 1.5 tons of lime in 1927 suffered no further loss.

Very acid soils hold their small amounts of lime very tenaciously, but heavily-limed soils suffer relatively rapid losses of lime. This simple but important conclusion may be used to interpret some common observations from practice. The average annual loss of from 4 to 5 cwt. of lime per acre from the manured plots in the Broadbalk wheat fields at Rothamsted has often been quoted for guidance in deciding lime dressings, but many farmers who pay careful attention to liming know that they can make good the inevitable wastage by much smaller dressings than this. The Broadbalk soil contains reserve calcium carbonate; it is fully saturated with lime in the sense of the definition used here, and its annual losses are inevitably high. Such a loss at Woburn would have exhausted the initial supply in fifteen years, whereas it has been shown that, except on the ammonium sulphate plots, one-half survived for fifty years. Again, it is well known that by restricting the rotation to rye, oats, potatoes and certain grasses it is possible to farm acid soils, especially in the wetter parts to the North and West of Great Britain, without using lime. Under these conditions of low lime saturation the annual losses of lime are low and are largely met by the slow weathering of soil minerals and by supplies contained in residues from deep rooting plants and dung. When it is desired to change the cropping to include more sensitive crops, a heavy initial liming becomes essential and, in addition, relatively frequent small dressings are required to hold the exchangeable calcium at its higher level and to make good the much larger annual losses.

Clearly, bearing in mind the simple principle that for non-calcareous soils lime losses depend on lime contents, it becomes difficult, if not impossible, to answer the question, "How long does a given dressing of lime last?" On a slightly acid soil a moderate dressing of lime will soon be lost, but on a very acid soil an equal dressing will have beneficial effect for many years. If tenant-right compensation for past liming is to take into account the actual survival of the lime in the soil, it will be necessary to

consider the degree of acidity or lime saturation before and after the lime was applied.

THE EFFECT OF FARMYARD MANURE.

Both on barley and wheat the farmyard manure plots had more exchangeable lime than the unmanured plots—in spite of the extra carbon dioxide produced in the soil by the decomposition of the organic matter, both of the farmyard manure itself and of the larger crop grown with its aid. Farmyard manure contains appreciable amounts of lime and other bases which are liberated as the manure decomposes. In addition, since humus has high absorptive power for bases, dung increases the amount of lime held for a constant percentage saturation. The relatively large loss of lime from 1927 to 1932 on the farmyard manure plots is due in part to the loss of organic matter through fallowing and cropping without manuring. The liberal use of dung will tend to reduce acidity, for in this way lime and other bases are transferred from the less acid to the more acid parts of a farm.

THE EFFECT OF NITRATE OF SODA.

The conservation of soil calcium by nitrate of soda has no such simple explanation as that by dung, though the effect has long been known and is often spoken of as "physiological alkalinity." Although nitrate of soda and the other common nitrates are neutral salts, they acquire an effective alkalinity under the influence of the growing plant which removes more nitrate than base and thus leaves an alkaline residue. The actual mechanism of salt absorption by plant roots is not fully understood, but it is sufficient for the present purpose to assume that the plant removes the nitrate as nitric acid and leaves sodium bicarbonate in the soil. The sodium equivalent to the nitric acid absorbed by the plant thus takes the place of a corresponding amount of soil calcium in combining with the bicarbonate and the loss of soil calcium is reduced. The total possible effect should not be exaggerated, for even if the whole of the sodium was effective the saving of lime would amount only to about one-third of the weight of nitrate of soda used. In the Woburn plots the excess of lime in the nitrate of soda plots over that in the plots without added nitrogen was about one-tenth of the weight of nitrate of soda used.

THE EFFECT OF AMMONIUM SALTS.

In contrast to nitrate of soda, ammonium salts are sometimes known as "physiologically acid" fertilisers. Although it

is true that most plants (and particularly cereals and grasses) rapidly absorb ammonia from its salts, leaving an acid residue, the acidifying action of ammonium salts in the soil does not depend solely upon this action of the crop, for the action is shown equally in uncropped soils. Many micro-organisms as well as plants absorb ammonia and in normal arable soils all ammonium salts are speedily converted into nitrates. No appreciable amount of ammonium is washed into the drainage waters from neutral or slightly acid soils and the loss of lime caused by sulphate of ammonia may, therefore, be expected to equal the amount of lime required to neutralise the nitric acid and sulphuric acid formed by the nitrification of the sulphate of ammonia, less the "physiological alkalinity" of the calcium nitrate.

The latter term introduces a factor depending on the actual crop grown and explains why independent estimates of the size of the effect fail to agree. One hundred parts of sulphate of ammonia require 41 parts of lime to form calcium sulphate and 82 parts to form both calcium sulphate and calcium nitrate (or more simply, 1 part of nitrogen as sulphate of ammonia requires 2 or 4 parts of lime respectively). Estimates of the practical effects of sulphate of ammonia on the loss of lime vary between these limits. The Woburn plots provide interesting illustrations of several alternative methods of calculating the effect.

During fifty years 0.74 ton of nitrogen per acre was applied, and on the unlimed sulphate of ammonia plots the top 18 inches of soil had 1.47 tons less lime than the plots without added nitrogen. This happens to agree perfectly with 2 parts of lime per part of nitrogen as sulphate of ammonia, *i.e.*, enough to form calcium sulphate but not nitrate. This agreement is probably fortuitous. For thirty years or more the unlimed crops have failed and the soils have been so acid that the normal losses as calcium bicarbonate must have been exceptionally low. If the sulphate of ammonia dressings had been higher it is unlikely that the lime losses would have been proportionate. In any case comparisons with almost sterile soils have little practical value. If, instead, one estimates the amount of lime required to raise the sulphate of ammonia plots to the same lime content as the "no nitrogen" plots the results for 1927 and 1932 do not agree. They range from about 2.7 to 3.6 tons of lime for 0.74 ton of nitrogen, or about 4 parts of lime per part of nitrogen.

A much more satisfactory basis of comparison is provided by considering the amounts of lime required to raise the exchangeable lime of the soils of the sulphate of ammonia series to the same level as those of the corresponding nitrate of soda series. This not merely allows for equal amounts of "physiological alkalinity" but it affords more comparisons and thus reduces

the errors from soil irregularities. It was found by experience during the Woburn experiments that after a dressing of 4 tons of lime per acre the sulphate of ammonia plots gave yields similar to those of unlimed nitrate of soda plots; the exchangeable lime values in Table III fully confirm the approximate equality of the effects of these treatments on the soil as well as on the crop. It will be observed that the lime needed to offset the acidifying effect of sulphate of ammonia on this basis is well above the higher value already mentioned. Actually 4 tons of lime were required for 3.6 tons of sulphate of ammonia supplying 0.74 ton of nitrogen—5.4 parts of lime per part of nitrogen or 112 parts of lime per 100 parts of sulphate of ammonia. This excess of lime, over the theoretical amount, is required because it was given but twice in relatively heavy dressings at intervals of eight or fifteen years and, as has already been shown, such heavy dressings are necessarily wasteful on this light soil. The nitrate of soda on the other hand exerted its "physiological alkalinity" every year without producing any temporary excess of lime. The merit of the "physiologically alkaline" and slightly basic fertilisers, such as nitrate of soda, basic slag and calcium cyanamide lies in the fact that the lime they add or save is given often in small amounts and is, therefore, used efficiently. In addition there may be a special advantage in that the lime is provided close to some other plant food in the soil. With ammonium sulphate the acidification is often ignored, as it was at Woburn, until the effects are obvious; lime must then be given in relatively heavy dressings, which allow rapid loss.

In recent years the range of nitrogenous fertilisers has greatly increased and sufficient experiments are not available for direct measurements of their respective effects on the soil lime. In discussions of their relative merits their effects on soil acidity are sometimes over-estimated. It may, therefore, be useful to set out a basis of comparison which seems sounder theoretically than those commonly adopted and which is also in harmony with the Woburn findings. Comparisons should be restricted to cases in which similar crops are grown and in which the abnormal effect of uncontrolled secondary effects of fertilisers are avoided. Nitrate of soda or nitrate of lime is taken as the standard for reference, and it is assumed that different nitrogenous fertilisers are used in rotation, or that sufficient lime is added as required, to keep both the crops and the soils of the same composition for all the fertilisers considered; in other words, conditions are assumed akin to those of general farming practice. Lime leaves the soil only in the plant or in the drainage water (as calcium bicarbonate, nitrate, sulphate or chloride); also the amounts of nitrate and bicarbonate will be the same for equal crops and constant soil composition, whatever

the form in which the plant absorbs its nitrogen; hence the extra loss of lime (over and above that when a nitrate is used) will be equal to the amount required to form calcium nitrate from the whole of the nitrogen together with that required to combine with any chloride or sulphate.

On this basis the extra losses of some common fertilisers will be:—

- Nil.* Nitrate of lime and nitrate of soda (assumed);
 Calcium cyanamide (pure)¹; Nitrochalk (15·5 per cent.N.).
 2 units of lime per unit of nitrogen. Ammonium nitrate;
 ammonium carbonate; ammonium phosphate; urea.
 4 units of lime per unit nitrogen. Ammonium sulphate and
 ammonium chloride.

THE EFFECT OF SUPERPHOSPHATE.

The effects of superphosphate and the other "mineral manures" (chiefly sulphate of potash) are not tested separately in most of the Woburn plots. If we assume from other evidence that the effect of potash salts is negligible, we may regard the "minerals" *versus* "no minerals" comparisons as being essentially tests of superphosphate *versus* no superphosphate. Table II shows that in the few early samples the plots with "minerals" had less exchangeable lime than those without, but that in 1927 the position was reversed and in 1932 the average effect of "minerals" was very slight. It is clear that superphosphate can have no very marked effect in either direction, if during fifty years the use of over 8 tons of superphosphate per acre can leave a doubt even as to the direction in which it affects the soil lime. There is clearly little support for the common dogma that "superphosphate uses up lime and acidifies the soil." The evidence of the Woburn plots is weakened, especially in the few early samples, by the fact that the "no minerals" and the "minerals" plots tend to lie in separate bands across the field and it is not possible to ascertain whether the plots had different amounts of lime when the experiment began. If an initial acidification is admitted, it is necessary to conclude that subsequently the effect has been reversed, for there can be no doubt that more lime has been lost in the last forty years or so from plots without superphosphate than from those with superphosphate. There is some reason to think that the calcium phosphates formed may react in very acid soil so as to liberate some of their calcium once more, but the safest deduction from the Woburn plots is that the effect of superphosphate

¹ Commercial calcium cyanamide has about 60 per cent. of total lime including about 20 per cent. as free quicklime. It behaves as an equal weight of sulphate of ammonia together with an equal weight of quicklime.

on soil acidity and soil lime is slight, so slight that by comparison with the other factors involved it may safely be ignored for practical purpose. This conclusion is confirmed by independent data from Rothamsted and many other experimental stations.

It therefore becomes a matter of some interest to discover the origin of the oft-repeated statement that superphosphate acidifies the soil. It may arise from such names as "acid phosphate" or "vitriolised bones," or from the fact that formerly superphosphate, when poorly made, may have contained appreciable amounts of free sulphuric acid. Modern superphosphate is undoubtedly acid and contains some free phosphoric acid as well as the soluble acid calcium phosphate. These react with some soil lime to form an almost insoluble calcium phosphate but the lime so combined is not lost from the soil and may even remain in a form available to plants. In any case it forms but a small fraction of the weight of superphosphate used. It may be, too, that the alleged acidification is based on comparisons with basic slag which supplies basic material equivalent to about one-third of its weight of lime and has a corresponding advantage on acid soils. Very frequently the application of superphosphate is held to be related to the occurrence of "Finger and Toe" disease. Although it is impossible, in the absence of definite studies, to deny the possibility that a soluble phosphate may stimulate the "Finger and Toe" organism (in much the same way that it increases the mobility of the lucerne nodule organism) there is no positive evidence of such an effect. In spite of prolonged enquiries the writer has failed to trace any satisfactory evidence that superphosphate does in fact adversely affect cruciferous crops by making them more liable to "Finger and Toe." Direct trials using modern methods of field experiment are greatly needed.

Superphosphate and, indeed, any other material containing soluble salts may sometimes intensify the effects of a given degree of soil acidity or unsaturation by displacing acid hydrogen from the soil into the soil solution. The actual intensity of acidity of the soil water depends on the amount of soluble salts present and this varies throughout the year with changes in salt content, being relatively high in dry spells and low after prolonged rain. Such effects are temporary, but their actual importance is not as yet fully understood.

It will be observed from the yields given in Table II that wheat with mineral manures was affected much less seriously than that without minerals by the increasing acidity due to sulphate of ammonia. It is well known that there is no single explanation for the harmful effects of soil acidity on sensitive crops, but that in fact many factors are involved. Probably the

essential difference between the barley and wheat in the Woburn experiments depends on the fact that the barley was entirely dependent on the acid surface soil whereas the wheat, having access to lime, potash and nitrate in lower depths of soil, was better able to withstand the adverse conditions of the surface soil.

OTHER EXCHANGEABLE BASES.

In the less acid Woburn soils the amounts of magnesium, potassium and sodium in the exchangeable form are small in comparison with the amount of calcium. In the first thirty years the mineral manures supplied sulphates of potassium, magnesium, and sodium, as well as of calcium (in superphosphate). After fifty years about one-half of the added magnesium, one-twentieth of the added potassium, and none of the added sodium remained in the exchangeable form. The greatest loss of exchangeable potassium was on the less acid plots, upon which relatively large crops were grown without added potash. On acidification the loss fell almost entirely on the calcium and there was no evidence that either extreme acidity or liming affected the exchangeable potassium.

FUTURE EXPERIMENTS.

Many important practical problems in liming still require examination by field experiments. Different amounts of lime must be tested on typical soils for their immediate and their residual effects over a period of years under ordinary crop rotations. Apart from their direct agricultural value such experiments would provide the greatly needed opportunity of standardising laboratory methods for investigating soil acidity and liming problems and would greatly increase their value in advisory work. Liming must be combined with fertiliser trials because it is not known, for example, whether liming an acid soil increases or decreases the response of crop to potash manuring. Direct tests are wanted to ascertain how far it is advisable to reduce the need for lime by special forms of manuring or whether it is better to lime sufficiently and have a freer choice of fertilisers. Few of the research and experimental farms have suitable soils for these tests and few farmers have hitherto been prepared to provide facilities for experiments lasting many years. The maintenance and improvement of the fertility of light land under arable cultivation still remains as pressing a problem as it was half a century ago, though the outstanding questions now to be considered are in terms of lime and organic matter rather than in terms of nitrogenous, phosphatic, and potassic fertilisers.

When in 1876 the Duke of Bedford gave the Royal Agricultural Society the opportunity for studying the light land problems of that period, it was necessary to equip a full experimental station at great expense. Fortunately, present-day requirements are on a much more modest scale. With modern transport facilities and the new technique of plot experiments, the staffs of research stations and advisory centres can conduct the necessary experiments on commercial farms and the results gain practical value just because they are obtained under practical conditions. Farmers with the spirit of the early pioneers, but without their resources, have the opportunity of making extremely valuable contributions to the advancement of agricultural science and practice. The requirements are suitable land, careful farming on a small experimental area over a period of years, and an appreciation of the principle that in the long run accurate information on a well-defined problem is of more value than a series of hasty answers to a number of miscellaneous questions of transient and local interest.

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THE DISPOSAL OF SUGAR BEET BY-PRODUCTS : BULLOCK FEEDING ON SUGAR BEET TOPS.

At various times since 1928 the importance of the by-products in the survival of the British beet sugar industry has been emphasised by the staff of the Norfolk Agricultural Station. The first report of feeding trials with beet by-products at the Station was issued by the Royal Agricultural Society of England in 1928 as an Occasional Note.¹ This was followed by a further¹ note in 1929 and by a complete survey (in this *Journal* for 1929)¹ of the use of beet pulp in

¹ Each of these publications was written by S. T. Johnson, M.A.

fattening bullocks. In that survey the problems were outlined. The opinion was expressed that the beet crop was most likely to become established in arable farming as part of the root shift; thereafter changes in feeding methods might be expected to arise, and it is one of these which forms the subject of the present report.

An intimate relationship between stock and arable farming has existed since the time the turnip was introduced and made part of the well known four-course rotation. Except for minor additions, the cropping in the root shift of that rotation has been undisturbed for well over a hundred years, and all its produce has been used for stock feeding and cashed as animal products. The rate of extension of the beet crop and the study of its more profound influences have been intensified by the circumstance that its development has coincided with a period of almost unprecedented agricultural depression; the prospect of an immediate cash return from the root break has been an irresistible attraction to the man struggling with hopelessly low prices for meat and other products. But apart from this unfortunate stimulus to the cultivation of beet, the bullock feeder must be in a better position if his root shift has already left a cash profit at the time when his stock feeding begins—or, in the less measured but more expressive agricultural phrase, if his root feeding has “cost nothing.” Such a possibility is presented by beet residue feeding.

Under these circumstances the acreage of sugar beet in Norfolk has risen to 66,000 acres in 1932 or 25 per cent. of the British crop. The area under stock feeding roots has decreased concurrently. This development, foreseen by several people, seemed likely to influence, if not to revolutionise, the whole practice of stock feeding on suitably situated arable farms. Investigation into this aspect of the new crop was therefore begun by the Research Committee of the Royal Agricultural Society of England in a series of trials at the Norfolk Agricultural Station. The first report showed that beet pulp was a very satisfactory root substitute for cattle. The first trial with beet tops was also encouraging and it was therefore repeated in each of three further years; this report gives the complete results of the investigation which, in the four years, involved the fattening of 79 bullocks.

Beet tops consist of the leaves and the crown of the beet, which the factories instruct growers to remove before delivery. The slice of beet constituting the crown may be regarded as a slice of a rich mangold, for its sugar content is rarely less than that of a mangold, and is often much higher.

Scientific feeding values have been placed on beet tops; Kellner gives the starch equivalent as 7.2, while Woodman,

as the result of most careful determinations at Cambridge, reaches a figure of 8.56. Beet tops should therefore in fattening practice prove rather better than mangolds or swedes, the starch equivalents of which are given by Wood as 6.2 (Intermediate Varieties) and 7.3 respectively.

It is obviously possible, however, that actual results from beet top feeding will be rather more variable than those from mangold or swede feeding, for whereas roots are carefully stored and cleaned before feeding, beet tops are not usually prepared for feeding in any way. As all authorities are careful to point out, fresh tops are likely to scour stock unless well wilted before feeding, and even then require, according to Kellner, the addition of 4 ounces of feeding chalk per 250 lb. tops, before they are reasonably certain to attain their maximum efficiency.

Moreover, no matter how determined one may be that the tops shall be used within a fortnight or so of topping, the fact remains that in the stress of autumn work, with its stubble cleaning, muck carting for wheat, ploughing, autumn sowings, beet delivery, and other equally pressing considerations in autumn arable farming, the beet tops are often inevitably neglected. This possibility must lead us to expect an occasional erratic result from the feeding of beet tops and, from time to time, a discrepancy between their theoretical and (for want of a better term) "practical" feeding value; the determination of this last can best be made in direct feeding trials, where the exigencies of stock feeding practice are permitted to exert their full influence.

THE TRIALS OF 1928-31.

The organisation of the trials varied very little during the period. Ten well matched North Country Shorthorns were chosen for each yard and 20 bullocks were fed each year. The average initial weights of the cattle in each yard differed by no more than 2 lb. per head in any one year and only on one occasion was it necessary to withdraw a bullock. The bullocks were approximately $7\frac{1}{2}$ cwt. live weight at the beginning of each trial and finished just under 11 cwt. each.

The concentrated rations, calculated to produce 2 lb. of daily live weight increase, are typical of many used, both in experimental and in routine feeding at Sprowston. They are based upon prevailing prices and are much more economical than those in which the indiscriminate use of popular foods, irrespective of their value, is made. Lower quantities of concentrates were fed at the beginning and were gradually increased to higher amounts for finishing. Thus in 1931

3 lb. of concentrates per day was fed at the beginning and 6 lb. at the end of the fattening period.

BASAL RATIONS IN EACH OF FOUR YEARS.
LB. PER BULLOCK PER DAY.

	1928.	1929.	1930.	1931.
Decorticated Groundnut Cake	1	1½	1½	1
Barley	0-2	2-3	1-2	—
Oats	—	—	1½-3	—
Wheat	—	1-2	—	—
Maize Meal (South African)	—	—	—	2-5
Maize Gluten Feed	2	—	—	—
Manioc (tapioca) Meal.	2	—	—	—
Seeds Hay	3½	—	7	7
Feeding Chalk	2 oz.	2 oz.	2 oz.	2 oz.

In 1929, a year of acute hay shortage in Norfolk, no hay was fed.

The tops were compared only with swedes, except in 1930, when a further comparison with mangolds was possible for a short period. Swedes are the normal pre-Christmas feed of the fattening bullock, and since tops cannot safely be left out, even in the Eastern Counties, much later than Christmas, they are the natural substitutes for swedes and not for mangolds. A further aspect of this question, however, is deferred till later.

SWEDES AND TOPS FED IN EACH OF FOUR YEARS.
LB. PER BULLOCK PER DAY.

	Tops.	Swedes.
1928	75	107
1929	85	95
1930	100	120
1931	100	120

The tops and swedes were fed in bins placed in the centre of the open portions of the semi-covered yards in which the trial took place. Neither the roots nor the tops were mixed with any other foods. In the first two years the tops were fed whole, and some wastage occurred in consequence; cattle prefer the crowns to the leaves and in feeding take the tops by the crowns and bite these off; unless therefore the operation takes place over the bins, the leaves fall to the ground, are trampled under foot and lost. In the last two trial years, the crowns were cut from the leaves by hand before feeding and in consequence there was much less waste, although labour costs were necessarily increased. The swedes were sliced by machine. Water was available in each yard and it was observed that while the cattle on swedes rarely drank, those on tops consumed about 6 gallons each daily. There were small and unimportant variations in the feeding time table, when it was thought desirable slightly to modify in the later years according to the experience of the earlier ones. In particular

it proved best to feed the tops in small quantities as there was then less waste: actually the wastage of tops was not more than 6 per cent. in 1930 and 2 per cent. in 1931. It is doubtful, however, whether such precision is necessary in practice. The small quantity of hay was chaffed and fed with the concentrates so as to avoid waste when, as was often the case, the concentrates were rather mealy in character. Tops or swedes were usually fed at 6 a.m., followed immediately by half the concentrates and hay, this procedure being repeated at 1 p.m.; at 11 a.m. a third of the tops or roots was given, the necessary number of skeps being determined by frequent check weighings. The allowance of two ounces of chalk, with the preliminary wilting of the tops, was found to prevent actual scouring, although the cattle were always rather loose. In round terms, each bullock ate two and a half bushel of tops each day.

THE LIVE WEIGHT GAINS.

Monthly weighings were carried out each year. Broadly, the root feeding data show how near to expectation the results of feeding to a scientifically compounded ration may be over a period of years. The remainder show with equal certainty how a new and comparatively untried food may impair the efficiency of the ration and may prevent the attainment of the live weight increase of 2 lb. per day which was laid down as the object in these trials.

DAILY LIVE WEIGHT GAINS PER HEAD IN EACH OF FOUR YEARS.

	Fed on beet tops.	Fed on swedes.	Difference. ¹
1928	1.9 lb.	2.5 lb.	.6 lb.
1929	1.6 "	1.6 "	—
1930	1.7 "	2.0 "	.3 "
1931	1.5 "	2.3 "	.8 "
Whole period .	1.67 "	2.1 "	.43,,
Total No. of Bullocks	40	39	

Taking the average live weight increases for the whole period as the criterion of comparison, beet tops are less efficient than swedes to the extent of nearly half a pound of live weight increase per day. Such a general statement, however, requires more critical examination which may be made by reference to the footnote, where there is a statistical statement regarding the reliability of the results. In more ordinary language that statement indicates that the extra .43 lb. of live weight increase gained per day by the swede-fed animals is a true indication that swedes are better than beet tops; in fact, from the results obtained, the chances are 100 to 1 on that being so. In each

¹ The standard errors of the differences in the four years are: 1928, 0.24 lb. 1929, 0.19 lb.; 1930, 0.15 lb.; 1931, 0.24 lb.; whole period, 0.12 lb.

year (except 1929) the chances that the difference is really due to the feeding and not to any chance variations in the cattle are respectively, 20, 20, and 100 to 1. There is no doubt, therefore, that it has not been found possible to recover, in practical bullock feeding, the whole of the theoretical feeding value of beet tops. An estimate given later shows the extent to which this loss affects the stockfeeder interested in the substitution of sugar beet for other roots.

It should, however, be said that apart from slight modifications in experimental technique, which undoubtedly increased the reliability of the trials of 1930 and 1931, those two years were ideal for beet top storage in the field; whereas in 1928 and 1929 the conditions were unsatisfactory, much rain, frost and snow being experienced. Nevertheless, and although there was much more waste, especially in the frosty winter of 1928 when the bullocks discarded the frosted tops, the cattle did just as well on tops in the bad as in the good weather.

In 1929 the cattle as a whole did badly, and those fed on roots were particularly disappointing. Even so, the exclusion of the 1929 figures does no more than to increase the average difference in daily live weight increase from .43 to .5 lb., and does not affect the broad inferences to be drawn.

THE CARCASSES.

The carcasses of forty-eight bullocks were examined in the last three years of the trials. They were drawn in equal numbers from each yard, a procedure which possibly militates against the carcase weights of the cattle fed on beet tops, since these cattle had not done so well in the early stages as the others. As, however, none of the animals were finished, either on the tops or on the swedes, by the time top feeding had been stopped in the natural sequence of events, the carcase determinations apply to animals finished on roots (mainly mangolds), after a preliminary period on beet tops and swedes respectively. Actually the beet tops were fed until 18th December, 14th January, 21st January and 22nd January (or for 67, 79, 91 and 80 days respectively) in the four years.

Fourteen carcasses were examined in 1929, twenty in 1930 and fourteen in 1931; twenty-four from each type of feeding were subjected to the slaughterman's tests. They were drawn over varying periods—38 days in 1929, 50 and 18 days respectively in the other years. Messrs. W. J. Algar and Sons, who have a large and select trade in Norwich, bought the beasts and it is by reason of their courtesy and expert assistance that the following results are available.

CARCASE WEIGHTS.

	Average Dead Weights.				Percentage Dead to Live Wt.	
	Tops.		Swedes.		Tops.	Swedes.
	St.	Lb.	St.	Lb.	%	%
1929	41	13	43	5	53·7	55·3
1930	47	9	49	8	54·7	55·6
1931	48	3	47	1	55·5	55·5
Average of 24 Bullocks (total 48)	45	13	46	9	54·6	55·5
(1 stone=14 lb.)						

The carcase percentages are of dead to unfasted live weight ; they would, of course, have been higher if calculated from fasted live weights ; neither are they quite comparable with the percentage dead weight determinations of cattle weighed alive over the market weighbridge, which have commonly lost about 5 per cent. of their unfasted live weight in being handled and in travelling to the market. The figures given above are therefore a slight understatement as judged by the cattlemen's usual standards, but the influences of course affect each group equally, and the data are strictly comparable. It will be observed that the swede-fed carcasses were 10 lb. the heavier, but otherwise the top-fed bullocks killed out quite as well as the others.

In trials with beet pulp the marked tendency of this material to produce white fat had been noted and it was thought possible that a similar effect would be produced by beet tops. In the animals examined this was not so, but it must be remembered that the carcasses were not inspected until after the finishing period of root feeding, and that this may have masked any difference. In any case it is not a very important matter because the white fat resulting from beet pulp feeding, which is quite distinct from the yellow fat of root feeding, is quite unobjectionable and did not, in the cases mentioned, impair the sale of the meat in any way. Moreover, few bullocks are completely fattened on tops because the latter do not last long enough. Any effects on the flesh, therefore, are more likely to be those of the finishing food and the possibility of troubles comparable to milk taints (which are often experienced when feeding milking cows on tops) does not arise in the case of fattening bullocks.

A PRACTICAL DISCUSSION.

At this stage it may be not unprofitable to apply one or two practical standards to the results. As the beet tops did not prove equal in feeding value to swedes, extra food would be required to achieve the like result, or alternatively a longer fattening period would be entailed.*

* The standard error of the difference (averaging the three years) is 0·42 per cent. Hence the above difference of 0·9 per cent. in favour of those fed on swedes is not significant.

The bullocks on beet tops increased approximately half a pound a day less than the others—a deficiency which theoretically should be made up by feeding an extra $1\frac{1}{2}$ lb. of maize meal per day. In order to test this point and if possible to obtain further confirmation of the relative inefficiency of the tops, a third yard of cattle was added in 1932. These were fed on the same amount of beet tops as the other tops group but received an additional $1\frac{1}{2}$ lb. maize meal per head per day; otherwise the feeding and management were identical.

The result was to raise the daily live weight increase to 1.92 lb. per day, which is just below the theoretical expectation of 2 lb.

This subsidiary trial is useful because it confirms the conclusion drawn by the more direct method, that beet tops are not quite equal in feeding value to swedes; moreover, it gives an approximate measure of their deficiency which, as already indicated, is equal to approximately $1\frac{1}{2}$ lb. of maize meal per day; to make this good would entail, at present prices, an addition of about 6*d.* to the weekly cost. It should, however, be stressed that the deficiency of beet tops might be less marked with a smaller daily ration, those used in the trials being probably as heavy as would ever be fed in British practice, and scarcely typical of the country as a whole.

Two further questions must be answered. Did the cattle recover any of the lost ground after the tops had been finished? And did they fatten as quickly as those fed on roots for the entire period? Obviously the reply to those questions determines to some extent the ultimate cost of the live weight increase.

The answers will be more generally applicable if we employ only the results of the 1930 and 1931 trials, which were based on the experiences of the earlier years, and are therefore more likely to typify the methods followed on beet-growing farms. After the tops were finished each yard of cattle was subsequently fed on roots, monthly weighings were continued and the dates of killing recorded.

The average daily live weight increases up till January, and after January when all the bullocks were on roots, show that a considerable relative recovery was made by the animals previously fed on tops.

AVERAGE DAILY LIVE WEIGHT INCREASE, LB. PER HEAD.

		Nov.-Jan.	Jan.-March.
1930.	Roots	2.07	1.29
	Tops	1.68	1.69
1931.	Roots	2.32	1.68
	Tops	1.56	2.12
1930 and 1931.	Roots	2.20	1.48
	Tops	1.62	2.05

As both yards received similar rations after January the daily cost for both groups was the same. All the animals, however, were fat before those which started on tops had recovered all the leeway. In consequence the top-fed cattle ended 24 lb. lighter on the average than the others.

It is important to note that only the weighbridge disclosed these differences; to the eye the bullocks were throughout almost identical—their coats, general appearance and touch were the same.

The speed of fattening remains to be considered. It is one of the most important factors in the economy of beef production. The three years when records were kept of the length of time taken to finish the beasts show some variation; in one year the tops yard was sold earlier; in 1931 it was later; and in 1929 there was nothing between them. The details are given below.

NO. OF DAYS TAKEN TO FATTEN.

	Fed on Tops. Then on Mangolds.	Fed on Swedes. Then on Mangolds.
	Days.	Days.
1929 . . .	132	134
1930 . . .	174	195
1931 . . .	146	139
Average . . .	151	156

What happened is fairly obvious. The bullocks on tops did not do so well as those on roots, but after the tops had been finished, and they were given roots instead, they made up to a large extent for their earlier slow progress. The story is well illustrated by the graph¹ showing the monthly weights before and after top feeding. Over the complete fattening period the animals fed on tops finished just as quickly as the others, but they were not as heavy. Although the difference in weight is small and not statistically significant, the fact remains that it was consistently repeated each year. There was definitely no difference in the carcass percentages, but the root fed bullocks sold better on the average by 8s. 3d. per head, the details being:—

	Fed on Tops. Then on Mangolds.	Fed on Swedes. Then on Mangolds.
	£ s. d.	£ s. d.
1929 . . .	26 4 6	27 1 11
1930 . . .	25 0 7	26 0 6
1931 . . .	26 10 4	25 17 9
Average . . .	25 18 6	26 6 9

Twenty-four bullocks from each yard were sold by dead weight and the remaining eleven in the cattle market. The sale prices of the eleven (of which six were fed on tops and five on roots) confirm the higher value of the root-fed animals.

¹ See p. 232.

It may be inferred that the 8s. 3d. difference in sale price could be made up by better treatment during top feeding, as for instance, by adding maize meal to the extent of $1\frac{1}{2}$ lb. per head per day, which proved sufficient to maintain the standard live weight increase of 2 lb. per day. The economy of doing so is, however, doubtful.

THE HANDLING OF BEET TOPS IN PRACTICE.

The inefficiency of beet-top feeding relative to swedes, over the lifting period which may extend from the end of September to the early days of January, has been indicated. Beet tops vary in composition according to the skill employed in topping the beet. It is well known that the crown of the sugar beet contains less sugar than the regions below it. If, therefore, men topping beet habitually cut too low or too high, the beet tops will be respectively better or worse in feeding value. In seasons conducive to exceptional leaf growth, or on rich soils, or again after heavy nitrogenous manuring, the proportion of leaf to crown is increased and the feeding value is reduced, for in general the greater the proportion of leaf the lower the feeding value of the tops.

Weather also plays an important part. Tops left out soon begin to decay; frost reduces the sugar content of the crown and the rotted leaves are usually discarded by stock. While, therefore, it is very desirable in practice to allow the tops to wilt before feeding, in order to reduce scouring, it is equally desirable to feed them before decay has set in. But it is not always easy to do so. The tops are a by-product and they become available as and when the exigencies of beet lifting permit. Weather and factory delivery-permits (controlling lifting and delivery respectively) also control top collection for feeding. Nevertheless, with good management it is usually possible to avoid feeding tops with rotted leaves. It becomes a question of feeding them within say three weeks of topping, although obviously tops may be left out longer at the beginning of the lifting period. The importance of giving careful consideration to this point is illustrated by analyses of crowns made at intervals during 1932. The results given below show a progressive decrease in sugar and therefore in feed value:—

Beet Topped on—	Sugar Percentage of Crowns analysed on			
	8th Nov.	23rd Nov.	13th Dec.	20th Dec.
8th November . . .	15.7	14.1	14.3	12.2
23rd November . . .	—	12.8	12.1	11.5

In the mild autumn weather often experienced in East Anglia, beet crowns in close contact with the ground will grow

from buds in the axils of the decayed leaves, with consequent and rapid depletion of their sugar content.

In the Eastern Counties it is possible, as a rule, to leave the tops out and cart straight in for feeding. When frost is expected, it is a good plan to throw together several of the small heaps left by the toppers, forming large ones of several cart loads each. Then, even in frosty weather, unfrosted tops will be available. It is probable that adhering dirt impairs the efficiency of the tops. In bad weather they are dirtier and more gritty, and the bins in which they are fed need more frequent cleaning. In fact rather greater attention to the feeding troughs is necessary when tops are being fed, for a surprisingly large amount of debris is usually left daily, which must be removed with strict regularity if the animals are to be kept on their feed.

In the yards, waste can be prevented by cutting the crown from the leaves, but the practice is of doubtful economy, though necessary in experimental work. It took three quarters of an hour daily to cut the tops for 10 bullocks (or $4\frac{1}{2}$ minutes per bullock), the cost of which operation, though small, is not negligible. It might, therefore, pay to encourage the cattle to waste the leaves and eat the crown. Furthermore, it might pay handsomely roughly to wash the tops before feeding; this could be done by throwing into a tank, leaving for a while and forking out as required. Both points would probably repay investigation.

Beet harvesting operations should be watched in order to ensure that the beet tops are not unduly fouled during knocking, and especially during beet carting. The rows of tops should be left wide enough apart to permit free passage of the carts. So long, however, as it remains necessary to top the beet after, instead of before lifting, it will be impossible to obviate altogether this difficulty of adhering dirt.

If the beet could be topped before lifting it would probably be easier to keep the tops clean; at the moment this is not practically possible; attempts to do so by machine have not met with unqualified success.

The tops are also cleaner and less damaged when the beet are lifted by hand spud. The leaves are then not lost or damaged as inevitably happens when a lifter and horses pass through; moreover the land is not disturbed to anything like the same extent. The efficiency of the lifter too, has a relationship to the state of the tops: with one type of lifter it is very difficult to clear the bolters, which then often cause blockages of accumulated dirt and untopped beet, with consequent and considerable damage to the leaves.

Weather, however, is the chief factor determining the

condition of the beet tops and it is of special importance, in bad weather, to keep the top collection and feeding abreast of the beet lifting; in fine weather the consequences of negligence are not so serious, although no one can afford to neglect the fall in sugar which occurs in good as well as in bad weather and which, in a month, may reduce the feeding value by as much as 20 per cent.

THE STOCK CARRYING CAPACITY OF BEET BY-PRODUCTS.

Perhaps the greatest value of these trials is the opportunity they give to estimate under practical conditions the effect on the stock-carrying capacity of a favourably situated beet-producing arable farm, where sugar beet is entirely substituted for other roots. It is possible to calculate from the live weight increases the equivalence of beet tops and swedes on a tonnage basis; when that is done, the results are as follows:—

Year.	Swedes equal to 1 ton of Beet Tops. Tons.
1928	1.08
1929 . . . . .	.95
1930 . . . . .	.91
1931 . . . . .	.80
Average (4 years) . . . . .	.93

It has already been mentioned that there was some wastage in 1928 and 1929. No allowance for that wastage, however, has been made in the above table, since the feeding value had been irretrievably lost, a state of affairs quite likely to arise in practice. It is useful, however, to note that when the waste is allowed for, the ton of tops in 1928 and 1929 were respectively equal to 1.27 and 1.12 tons of swedes, from which it seems that the average figure (.93 for the four years) is an underestimate, rather than an overestimate, of the feeding value of tops as they are usually fed in yards.

If a fattening bullock is fed 112 lb. of roots daily during a fattening period of 20 weeks, 7 tons will be eaten in all and on feeding farms where no sheep are kept two bullocks per acre of roots will be fattened during the winter on a 14-ton crop, or three per acre on a 21-ton crop. Of course, if the root ration is halved twice these numbers of cattle may be fed, but extra concentrated starchy foods will be necessary to make up the deficiency. A carrying capacity of 2-3 bullocks per acre of roots may be taken as a standard for comparison with feeding on beet by-products.

Since one ton of tops proved equal to .93 ton of swedes

in the Sprowston trials of the last four years, it follows that 7 tons of swedes would be equalled by $7\frac{1}{2}$ tons of tops. What proportion of an acre $7\frac{1}{2}$ tons of tops represents is problematical, for yields of beet tops are extremely variable¹ and there is little information on the subject. It is indeed almost impossible to obtain a figure truly representative of the yield of a single field, so many factors influencing the determinations over the beet lifting season. Undoubtedly the most reliable estimates are those which were made on a large number of farms in 1927, 1928 and 1929 by the Farm Economics Branch, University of Cambridge. The average of the whole is given as 8.1 tons per acre, which is so close to the $7\frac{1}{2}$ tons of beet tops required to fatten a bullock that it would obviously be unsafe to rely upon an acre of beet tops to feed more than one bullock. Actually it would be more accurate to say that an acre of tops will feed two bullocks for half their fattening period, for the tops are not usually available for finishing bullocks started in October. Nevertheless, one bullock per acre may be taken as a measure of the carrying capacity of an acre of tops regarded as a substitute for roots. To complete the comparison it is necessary briefly to refer to sugar beet pulp. The Norfolk trials reported in this Journal have clearly demonstrated that the theoretical equivalence of 1 to 8 between beet pulp and roots holds with a fair degree of accuracy under the rather rigorous open-yard method of fattening.² The yield of beet pulp is rather more than 5 per cent. of the tonnage of beet delivered to the factory, but is usually taken at that figure for the purpose of distributing the output. Therefore, if all growers claimed their pulp and the average yield was 10 tons of washed beet per acre, there would be half a ton of dry pulp available for every acre of beet grown. Actually all growers have not so far claimed their pulp and the average beet yield of the country is less than 10 tons per acre, but taking it as 8 tons per acre the dry pulp yield is .4 ton per acre, which is equal in feeding value to 3.2 tons of roots or nearly equivalent to half the 7 tons of roots required to

¹ In "Sugar Beet Trials in Norfolk 1924-27" it is shown that 3 cwt. of nitrate of soda increased the yield of tops by 3 tons 13 cwt. and 1 ton 16 cwt. in 1926 and 1927 respectively.

Unpublished trials on light soils in Norfolk show that choice of variety alone may cause variations of as much as 3 tons of tops per acre.

² The comparison in each of four years was:—

1927.	1 ton of pulp equalled 8 tons swedes.
1928.	" " " 6 " "
1929.	" " " $7\frac{1}{2}$ " "
1930.	" " " $8\frac{1}{2}$ " "

The average of which is nearly $7\frac{1}{2}$.

fatten one bullock. In other words where rations are fed equivalent to 112 lb. of roots, the beet by-products from each acre of sugar beet, substituted for an acre of roots, will fatten $1\frac{1}{2}$ mature bullocks. There is, therefore, a reduction in stock-carrying capacity, when beet is substituted for roots, of $\frac{1}{2}$ to $1\frac{1}{2}$ bullocks per acre—depending upon the probable yield of the roots. If the tops actually behaved in practice according to their analysis, the gap would be slightly reduced. Without further examination it would appear that an acre-for-acre substitution of beet for roots would have serious effects in reducing the stock-carrying capacity. Less stock would be kept, there would be less manure, the fertility of the holdings would gradually deteriorate and yields in consequence would become less. That, of course, is an exaggeration. Roots or root substitutes are not the only foods for fattening bullocks. Cereals and hay could quite well be substituted for half or more of the large root rations used in these trials. 56 lb. of roots or 50 lb. of tops fed daily to each animal, with the addition of, say, 3 lb. of rolled barley and 5 lb. of hay, would not only supply a diet more typical of English fattening as a whole, but would provide home grown root substitutes not for $1\frac{1}{2}$ bullocks but for 3 bullocks per acre—a concentration of stock quite heavy enough to convert into manure all the straw of the heaviest straw-producing four-course farm. It is merely a question of reducing the root substitute ration and as many stock as before may be kept: the straw on a beet growing farm may be just as easily and as quickly converted into manure as on any other farm. An illustration may, however, be useful. It shows the gradual change-over of a small Norfolk feeding farm from roots to sugar beet.

Average of Seasons.	Swedes and Mangolds. Acres.	Sugar Beet. Acres.	Bullocks fattened
1923 and 1924	31	2	47
1925 and 1926	20	11	38
1927 and 1928	8	30	42
1929 and 1930	0	40	59

The number of pigs kept also increased slightly over the period.

At Sprowston the change-over during six years from 35 acres of roots to 30 acres of sugar beet and 5 acres of roots has not reduced the head of stock. The farm is 174 acres arable and last winter fattened 55 bullocks and 50 sheep and even so it was not easy to dispose of all the roots grown.

THE VALUE OF BEET TOPS.

It is suggested that the money value of an acre of tops for bullock feeding must be estimated in relation to the cost of

growing an acre of roots or, better still, in relation to the cost of growing a ton of roots. Here again is a variable factor, influenced largely by potential yield. Various estimates, based upon costings, have been made. In general they are much higher than is commonly supposed. The Agricultural Economics Research Institute, Oxford, give net costs per ton of mangolds ranging from 11s. 6d. to 20s. 5d.; 9s. 11d. to 20s. 5d.; and 11s. 2d. to 16s. 1d., in the years 1927, 1928 and 1929 respectively; the costings relate to a number of Midland farms. The Farm Economics Branch, Cambridge,¹ gives the average cash cost of mangolds on twenty-six East Anglian farms from 1923-1927 as £20 11s. per acre, including the cost of carting to yards; and assuming a yield of 19 tons per acre estimates the cost as 17s. 9d. per ton. The same report states that the net cost of growing swedes and turnips was £6 17s. 4d. per acre, to which must be added the cost of harvesting and carting to yards when they are fed to cattle. When that is done, the cost per ton of swedes based upon the average yield in Norfolk is not less than 14s. It is obvious, therefore, that an absolute figure cannot be placed upon the feeding value of beet tops. If swedes or mangolds vary in cost, so must also the value of beet tops considered as a substitute for those roots; similarly the value to be placed on home grown barley will vary with the market price of its substitute maize. So the following table covers a range of swede costs:—

When Swedes cost the following, carted to the yards: per Ton.

	s. d. 10 0	s. d. 12 6	s. d. 15 0	s. d. 17 6
Value of 1 ton beet tops is	9 4	11 7	13 11	16 2
Cost of collecting and carting beet tops per ton	3 4	3 4	3 4	3 4
Value in field for bullock feeding—				
(a) Per ton	6 0	8 3	10 7	12 10
(b) Per acre (8 ton yield)	48 0	66 0	84 0	103 0

The figure of 3s. 4d. per ton for collecting and carting can only be approximate, and is based upon a carting distance of half a mile.

For other practical reasons it is necessary to attempt also a rough comparison of the value of beet tops with mangolds. Beet competes at all times in its cultivation with mangolds, if the labour on the farm is not to be unduly disorganised. An extension of the beet crop is most conveniently made at

¹ "Four years' farming in East Anglia, 1923-27," R. McG. Carslaw, M.A.

the expense of the mangold acreage, although for convenience of feeding, as already stated, tops more easily replace the pre-Christmas fare of swedes.

Competition for labour at drilling, hoeing and lifting, is, however, more likely to be the deciding factor. In 1931 the tops lasted long enough to be compared directly with mangolds. Then one ton of tops equalled .88 ton of mangolds and .80 ton of swedes respectively, to all intents and purposes the same result. Remembering that the feeding values of swedes and mangolds are very similar and that feeding trials can never be as precise as determinations in a chemical laboratory, it is not unreasonable, for the practical purposes of these trials, to apply the swede equivalence of 1 ton of tops (.93 ton) to mangolds also. Then the calculation above applies equally to mangolds.

There is another way of valuing the tops; this is by comparison with dry pulp, which during three years was fed to a third and adjoining yard of cattle, the results of which trials have already been published.¹ Calculating from these trials the following equivalents are obtained:—

One Ton of Tops equalled.			
1928	.	.	.17 ton beet pulp
1929	.	.	.11 " " "
1930	.	.	.11 " " "
Average	.	.	.13 " " "

Adopting the method used in comparing the tops with swedes, the corresponding values based upon the price of pulp (which is, of course, fixed by the factory), are:—

When the price of Beet Pulp per Ton is:—

	£ s. 3 10	£ 4	£ s. 4 10	£ 5	£ 6
The value of 1 ton beet tops is	s. d. 9 1	s. d. 10 5	s. d. 11 8	s. d. 13 0	s. d. 15 7
Cost of collecting and carting per ton	3 4	3 4	3 4	3 4	3 4
Value—					
(a) Per ton	5 9	7 1	8 4	9 8	12 3
(b) Per acre (8 ton yield)	46 0	57 0	67 0	77 0	98 0

It will be observed that there is no serious discrepancy in the values obtained by the two methods; in fact, with due regard to the market fluctuation of beet pulp prices and the cost of producing swedes, there is considerable agreement.

¹ "Bullock Feeding of Sugar Beet Tops and Pulp," S. T. Johnson, M.A., Journal R.A.S.E., Vol. 99, 1929.

It is generally accepted that 1 ton of beet pulp is equal in value to 8 tons of roots. Therefore, in the two tables immediately above the values of 10s. per ton of roots and £4 per ton of pulp are comparable; so also, therefore, are the values of beet tops based upon them. In calculating the following table, however, it was thought best for comparative purposes to adhere to the results of the trials in which $7\frac{1}{2}$ tons of roots equalled 1 ton of pulp.

Cost of Swedes per Ton.	Cost of Beet Pulp equivalent per Ton.	Value of 1 ton Beet Tops compared with cost of equivalent feeding value of	
		(a) Swedes.	(b) Beet Pulp.
10s.	£3 15s. 0d.	6s. 0d.	6s. 5d.
12s. 6d.	£4 13s. 9d.	8s. 3d.	8s. 10d.
15s.	£5 12s. 0d.	10s. 7d.	11s. 3d.

Without claiming any particular accuracy either for the method used in compiling the above table or for the results it may be taken to give a rough basis for a general valuation of beet tops in cattle feeding. Probably the level nearest to practice in the comparison is £4 13s. 9d. for pulp, and 15s. per ton of swedes or mangolds. Then the tops are worth respectively 70s. 8d. and 84s. 8d. per acre. In other words, tops have an enhanced value if roots are the only alternative for feeding. But in any case tops are a valuable food for cattle and apparently worth more for feeding than for manuring. Whether they should be carted off for cattle or fed to sheep (thereby saving the carting) is another part of the general problem of their economical disposal which is under investigation at the Norfolk Agricultural Station, and the interim results of which are given under the Research Committee's report on page 195.

Mr. S. T. Johnson, M.A., was responsible for the Trials in 1928 and 1929 and Mr. E. T. Sykes, B.A., in 1930 and 1931. Mr. Sykes also undertook all the statistical work in connection with this final report. To both the writer tenders grateful thanks.

SUMMARY.

1. It is possible that the establishment of the Sugar Beet crop in English arable farming depends as much upon the use of the residues for stock feeding as upon any other factor. A displacement of stock feeding roots by sugar beet has already been noted in the official statistics for the Eastern Counties.
2. Thus fattening cattle and sheep have, perforce, to be fed partly on beet pulp and beet tops.
3. Beet tops were compared experimentally with theoretically equivalent quantities of swedes for fattening bullocks.

The trials were repeated four times and seventy-nine bullocks were fattened. The beet tops did not equal the swedes, the respective live weight increases from rations calculated to produce 2 lb. live weight increase per day being 1.67 and 2.1 lb., the difference being significant in every year except one. A subsidiary trial showed that the deficiency of approximately .5 lb. of daily live weight increase could be compensated for by feeding an additional $1\frac{1}{2}$ lb. of maize meal daily to each animal.

4. It was possible to feed beet tops on the average for nearly 80 days, after which period the bullocks were finished on mangolds. The ones previously fed on tops made larger live weight increases after top feeding finished than those fed continuously on roots. The former did not, however, quite recover the whole of the lost ground, although they were fat just as early as the others. When sold the root-fed bullocks made 8s. 3d. each more than those fed on tops.

5. No effects of beet top feeding were noted in the carcasses, the whiteness in the fat (associated with beet pulp feeding) being absent, or masked by the subsequent root feeding. The dead to live weight percentages were identical.

6. The feeding value of beet tops is variable and depends upon the variety of sugar beet, the manuring, the way the beets are topped, the method of beet lifting, the length of time the tops are left on the field, the quantity of adhering dirt and above all the weather. The yield of beet tops is even more variable and is almost impossible to measure accurately.

7. Two ounces of feeding chalk fed per day to each bullock checked the tendency of the beet tops to cause scouring.

8. Compared with an acre of roots yielding 21 tons, which will provide 1 cwt. of roots per day for 3 bullocks over a fattening period of twenty weeks, an acre of sugar beet supplies residues in the form of beet pulp and tops sufficient to fatten $1\frac{1}{2}$ bullocks. The acre-for-acre substitution of beet for roots will hence result in a decreased stock carrying capacity unless extra home grown or purchased food is used. It is suggested that half the ration of tops or beet pulp used in the Norfolk trials, with the addition to the daily ration of 3 lb. of barley and 5 lb. of hay, will maintain all the stock required to turn the straw into manure on a four-course arable farm.

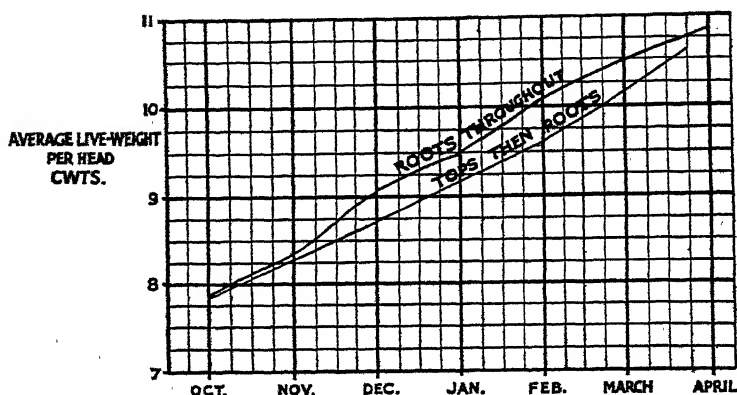
9. A method of valuing beet tops in comparison with the cost of a corresponding food equivalent of swedes or mangolds is given and checked by comparison with the cost of beet pulp. In the trials one ton of tops equalled .93 ton of swedes or .13 ton of dry beet pulp. An absolute money valuation cannot be placed upon beet tops, but when mangolds or swedes cost 15s. per ton to grow, beet tops are worth 19s. 7d. per ton.

When dry pulp costs £4 13s. 9d. per ton beet tops are worth 8s. 10d. per ton or, assuming an 8 ton yield, just over £3 10s. 0d. per acre.

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APPENDIX.



Graph showing the live weights, month by month, of cattle fed continuously on roots and of cattle fed first on beet tops and then on roots—average of three years' results.

CONTEMPORARY AGRICULTURAL LAW.

I.—LEGISLATION.

AGRICULTURAL interests have received much attention in Parliament in 1932 and there have been several Acts passed which relate thereto.

The Horticultural Products (Emergency Customs Duties) Act, 1931, (22 Geo. 5, c. 3) was the forerunner of the new legislation imposing protective tariffs on imported goods (other than Empire products) competing with British produce. It made provision for the imposition of Customs Duties on certain descriptions of fresh fruit, fresh vegetables, flowers, bulbs, plants and foliage. The Minister of Agriculture and Fisheries might, with the concurrence of the Treasury, by order apply

the Act to any articles of any of the descriptions set out in the Schedule to the Act, but subject to the approval of the House of Commons. This Act was to continue in force for twelve months and no longer, and it has now been superseded by the Import Duties Act, 1932, (22 Geo. 5, c. 8) which has provided for the imposition of a general *ad valorem* duty of Customs and of additional duties on any goods chargeable with the aforesaid duty. This Act by Section 1 charged a general *ad valorem* duty of 10 per cent. on all goods imported into this country other than goods exempted under the Act. Sub-section 2 of the same section exempts from the provisions of the section goods of any class or description specified in the First Schedule to the Act or added thereto by the Treasury after receiving a recommendation from the Imports Advisory Committee and after consultation with the "appropriate Department"—which, in relation to agricultural or horticultural produce of a class or description produced in the United Kingdom, means the Board of Trade, the Ministry of Agriculture and Fisheries and the Secretaries of State concerned with agriculture and the fishing industry in Scotland and Northern Ireland. By Section 2 the "Import Duties Advisory Committee," to consist of a chairman and not less than two or more than five other members appointed by the Treasury, was to be constituted for the purpose of giving advice and assistance in connection with the discharge by the Treasury of its duties under the Act. By Section 3 power is given to impose additional Duties on special classes or descriptions of goods. Preference is given, by Section 4, to the Dominions, India and Southern Rhodesia, and by Section 5 to the Colonies. Section 7 empowers the Treasury, on the recommendation of the Board of Trade, to direct that, as respects goods of any class or description consigned from and grown, produced or manufactured in any specified foreign country, they shall not be chargeable with the general *ad valorem* duty or any additional duty, or shall be chargeable only at some specified rate less than the full rate. Orders made by the Treasury or the Board of Trade under this Act must be laid before the House of Commons to be approved of by resolution.

Under this Act additional duties have since been ordered on certain goods, including certain agricultural products. The Schedule excepts from duty a variety of goods, including wheat in grain, maize in grain, meat, live quadruped animals, wool and pit props.

The Destructive Imported Animals Act, 1932, (22 Geo. 5, c. 12) gave power by Section 1 to the Minister of Agriculture and Fisheries and the Secretary of State for Scotland, acting jointly, to prohibit by order, either absolutely or except under

a licence granted under this Act, the importation into and the keeping within Great Britain of any animal of the species *Fiber zibethicus* or *Ondatra zibethica*, commonly known as the musk rat or musquash. The Act further contains power to make regulations and prescribe form of licences for importation of the animal in question and for the grant and revocation of licences. Section 5 makes it necessary for the occupier of any land who knows that musk rats, not being kept by him under a licence, are to be found thereon to give notice to the appropriate department, who may take steps for their destruction, and enacts that no action for damages shall lie in respect of the killing or wounding of any musk rat found at large. Under the same section the appropriate department may delegate its powers to the agricultural committee of the county council in the case of England. Section 6 imposes penalties for offences under the Act. Section 8 contains a saving in respect of animals kept for exhibition or scientific research under a special licence. Section 10 gives power to the Minister and Secretary of State, if satisfied with respect to animals of any non-indigenous mammalian species that by reason of their destructive habits it is desirable to prohibit or control the importation or keeping of them and to destroy any which may be at large, to make with respect to animals of that species any such order as they are empowered by Section 1 to make with respect to musk rats.

The Wheat Act, 1932, (22 & 23 Geo. 5, c. 24) was passed to secure to growers of home-grown millable wheat a standard price and a market therefor and to make provision for imposing on millers and importers of flour, obligations to make payments calculated by reference to a quota of such wheat and as to the disposal of the moneys thereby received, to provide for such millers being required to purchase unsold stocks of such wheat and for purposes connected with the matters aforesaid. Section 1 provides that if in any cereal year (beginning on the 1st August in one year and ending on 31st July in the following year) the ascertained average price of home-grown millable wheat is less than the standard price, every registered grower shall, subject to the provisions of the Act and regulations and bye-laws made thereunder, be entitled to receive from the Wheat Commission a payment in respect of every cwt. of such wheat of his own growing sold by him in that year representing, subject to deductions for administrative expenses, the difference (referred to as the "price deficit") between the average price and the standard price. If in the month of June in any year the Wheat Commission make a representation to the Minister of Agriculture and Fisheries that it is expedient that any stocks of home-grown millable wheat then harvested,

being wheat sown during the preceding cereal year, should be bought by the Flour Millers' Corporation, the Minister may by order require that corporation to buy from the registered growers to whom the order relates such part of their stocks as remain unsold, but such order in any cereal year may not require the Flour Millers' Corporation to buy more than $12\frac{1}{2}$ per cent. of the "anticipated supply" for that year, and any order so made must specify a price not exceeding the standard price estimated by the Minister, after consultation with the Wheat Commission, to be as nearly as may be the price which would, in the area to which the order relates and at the date when it comes into force, be obtained by a willing seller from a willing buyer of home-grown millable wheat of fair average quality. In the case of default of the Flour Millers' Corporation to buy and take delivery of the wheat in question the would-be seller will be entitled to recover as a debt due to him from the Corporation a sum equal to the amount which would have been payable for the quantity if it had been bought at the price determined as aforesaid and the wheat in respect of which the sum is recovered will be forfeited to the Wheat Commission. The "anticipated supply" of home-grown wheat is not in any year to be reckoned at more than 27,000,000 cwt. (six million quarters). Section 2 provides that as soon as practicable after the cereal year ending on the 31st July, 1933, and the end of every subsequent cereal year the Minister, after consultation with the Wheat Commission, shall by order prescribe what he determines to have been the average price obtained by registered growers throughout the United Kingdom for home-grown millable wheat sold by them in that year and this will be the "ascertained average price" in relation to that year. The expression "standard price" in the list means the price of 10s. per cwt., i.e., 45s. per quarter. By Section 3, for the purpose of meeting the expenditure to be defrayed by the Wheat Commission under the Act, every miller and every importer of flour is made liable to make to the Wheat Commission in respect of each cwt. of his output of flour a "quota payment" of an amount calculated so as to represent as nearly as may be a sum equal to what would have been the price deficit in respect of the quota of home-grown millable wheat used in the production of that cwt. if the anticipated supply of such wheat for the cereal year in which that cwt. was delivered had been used at a uniform rate per cwt. of flour in the production of the estimated supply of flour for that year; but there is a proviso exempting the miller from quota payment in respect of any cwt. consisting only of meal delivered by him for consumption without further manufacture as animal or poultry food. By sub-section 3 of Section 3 the quota payments to be made are

to be of such amounts as may be prescribed by the Minister who, for purposes of calculating the amount so prescribed, is, after consultation with the Wheat Commission, to estimate (a) the average price obtainable by registered growers throughout the United Kingdom for home-grown millable wheat sold and to be sold by them in the cereal year in which the order will come into force and the price deficit per cwt. of such wheat ; (b) the supply of flour for that year to be delivered and retained for consumption or use in the United Kingdom. By Section 5 the Wheat Commission is given power to make bye-laws for giving effect to the provisions of the Act, including provision for the registration of all growers of home-grown millable wheat, and for making payments in advance during the cereal year on account of the deficiency payments which will become due in respect of wheat sold by registered growers in that year. Claims for payment must be vouched by "wheat certificates" issued by persons authorised in the bye-laws. By Section 13 when, by virtue of any charge or under a distraint, wheat of a registered grower's own growing is sold by a person entitled to enforce the charge or levy the distress the registered owner, to the exclusion of that person, will be entitled to receive any deficiency payment in respect thereof. The Act, which is of a somewhat complicated nature, contains many other provisions for carrying out its objects which it is not possible to deal with more fully in this article. The first schedule to the Act provides for the constitution of the Wheat Commission upon which so many duties are imposed by the Act. It is to consist of a chairman, a vice-chairman and seventeen other persons representing the interests of growers of home-grown wheat, millers of flour and other interests, to be appointed by the Minister of Agriculture and Fisheries. The second schedule deals with the constitution of the Flour Millers' Corporation, which is to consist of a chairman and four other persons appointed by the Minister after consultation with bodies representing, in his opinion, the interests of millers.

The Agricultural Credits Act, 1932, (22 & 23 Geo. 5, c. 35) to remove doubts makes provision with respect to mortgages for securing loans made by the company formed for the purposes of Part I of the Agricultural Credits Act, 1928, which deals with long term loans on mortgages of agricultural land, and under the Improvement of Land Acts, 1864 and 1899, for agricultural purposes. It enacts that a provision in a mortgage requiring the loan secured to be repaid by instalments of capital and interest as specified in paragraph (c) of sub-section (3) of Section 2 of the principal Act shall not be treated as being invalid by reason only that the mortgage is thereby rendered irredeemable for the period during which the instalments are

payable. Section 3 of the Act provides that when in pursuance of the power conferred by Section 71 of the Settled Land Act, 1925, a mortgage is granted by any persons entitled, whether under that Act or under the Law of Property Act, 1925, or the Administration of Estates Act, 1925, or otherwise, there may be inserted therein a provision that the loan thereby secured shall be repayable on any of the terms on which, by virtue of the provision of paragraph (c) aforesaid, a loan may be made repayable.

The Rights of Way Act, 1932, (22 & 23 Geo. 5, c. 45) is an important Act amending the law relating to public rights of way, which, however, does not come into force until 1st January, 1934. Hitherto in order to prove a disputed public right of way it was necessary to prove actual dedication by the owner of the land over which it passed or dedication to be presumed by the circumstances which included continuous use for a number of years by the public, but such use was only treated as evidence which might be rebutted by proof of absence of intention by the owner to make dedication or by the non-existence of any owner capable of dedicating during the period of use. It is now enacted that where actual enjoyment of a way has been had by the public as of right for a full period of 20 years such way shall be deemed to have been dedicated as a highway unless there is sufficient evidence of no intention of the owner to dedicate the way or unless it is proved that during the period of 20 years there was not at any time any person in possession of the land capable of dedicating. The onus of proof appears thus to be shifted on to the person disputing the right. Where any such way has been enjoyed as aforesaid for a full period of 40 years such way will be deemed conclusively to have been dedicated as a highway unless there is sufficient evidence that there was no intention during that period to dedicate the way. It is, however, provided for the protection of owners of land that a notice by the owner of the land over which the way passes inconsistent with its dedication as a highway placed before or after and maintained after the commencement of the Act in such a manner as to be visible to those using the way will in the absence of proof of a contrary intention be sufficient evidence to negative the intention to dedicate the way as a highway. It is further provided that the owner of land may deposit with the council of the county and with the council of the borough, urban, or rural district in which the land is situate (i) a map on a scale of not less than 6 inches to one mile of the land, and (ii) a statement indicating what ways he admits have been dedicated as highways. When such deposit has been made statutory declarations by the owner or his successors in title made within six years from

the date of the deposit to the effect that no additional ways (other than any indicated in the declaration) over the land delineated on the map have been dedicated to the public since the date of the deposit will, in the absence of proof of a contrary intention, be sufficient evidence to negative the intention of the owner or his successors in title to dedicate any such additional ways as highways.

The Town and Country Planning Act (22 & 23 Geo. 5, c. 48) is a long and somewhat complicated Act with respect to the development and planning of urban or rural land and to provide for the protection of rural amenities and the preservation of objects of interest or beauty and to facilitate the acquisition of land for garden cities. It comes into operation on 1st April, 1933, but it is only possible to deal with it very shortly in this article. It provides for the preparation of schemes by local authorities for the purposes of the Act and such schemes may deal with a great variety of matters, including amongst others the stopping up or diversion of existing highways, buildings, structures and erections, open spaces private and public, extinction or variation of private rights of way and other easements, dealing with and disposal of land acquired by the local authority, power to make agreements with owners, power to accept any property whether real or personal for the furtherance of the objects of the scheme, and limitation of time for the operation of schemes. Provisions may be inserted in schemes for prescribing the space about buildings, limiting number of buildings, regulating the size, height and external appearance of buildings and prohibiting building operations, etc. Any person whose property is injuriously affected by the operations of any provision contained in a scheme, or by the extension of any work under a scheme, being a provision or work which infringes or curtails his legal rights in respect of property, may recover compensation from the responsible authority, but power is given to the Minister to exclude compensation in certain classes of cases. On the other hand, there is a provision for recovery of betterment from owners of property increased in value by the operation of any scheme to an amount not exceeding 75 per cent. of the amount of the increase. Questions arising upon claims for recovery of compensation and for betterment are to be referred to an official arbitrator under the Acquisition of Land (Assessment of Compensation) Act, 1919. The responsible authority may purchase by agreement any land which they require for purposes of a scheme and, if unable to purchase by agreement, they may purchase compulsorily under certain conditions. Schemes may include provisions for the preservation of single trees and groups of trees and may specify areas of woodland as areas to

be protected. Powers are also given with respect to unsightly advertisements and hoardings.

II.—CASES IN THE COURTS.

1. *Labour*.—There have not been any cases reported bearing directly upon agricultural labour during the past year and the only case which may be useful in this respect is *Medler v. Medler* (1931, W.C. & I. Rep. 406), where it was held in the Court of Appeal that a workman employed in his father's business of selling fruit and vegetables in Norwich and Lowestoft, who was killed by an accident while on the way from his home in the latter place to the former, in the absence of evidence that he had visited the Lowestoft business on the day of the accident, was not killed by an accident arising out of and in the course of his employment so as to give rise to a claim under the Workmen's Compensation Act, 1925.

2. *Landlord and Tenant*.—The reported cases arising out of the relations of Landlord and Tenant of agricultural land have been more than usually numerous.

In *Digby v. Penny* (1932, 2 K.B. 491; 101 L.J.K.B. 615) the landlord of a farm served through his agents a year's notice to quit in the following form "In accordance with Section 12 sub-section 1, paras. (c) and (b) of the Agricultural Holdings Act, 1923, we do hereby give you notice to quit," etc. Sub-section 1 of Section 12 of the Act enables a landlord to avoid paying compensation for disturbance if his notice is given for one of the reasons there specified which include (a) failure to farm according to the rules of good husbandry, and (b) failure to comply within a reasonable time with a notice requiring him to pay rent in respect of the holding, or to remedy a breach of contract or conditions of the tenancy agreement consistent with good husbandry, but to do so the notice to quit must state that it is given for one or more of the specified reasons. In pursuance of the notice the tenant quitted the farm and made a claim for compensation for disturbance on the ground that the form of notice was not sufficiently in compliance with Section 12 sub-section 1 as to defeat his claim for disturbance because it did not in terms set out the reasons for which it was given. The Court held that the notice to quit had sufficiently set out the reasons for which it was given by the reference to the paragraphs of sub-section 1 of Section 12 so as to make it a valid notice to avoid compensation for disturbance.

Re O'Connor and Brewin's Arbitration (1933, 1 K.B. 20, 101; L.J.K.B. 706) was also a claim for compensation for disturbance by a tenant who had quitted. The tenant in this case claimed up to two years' rent of the holding, for which purpose it is necessary under sub-section 6 of Section 12 for the tenant to prove

that the loss and expense incurred exceed an amount equal to one year's rent of the holding. The claim he put in was merely "Disturbance two years' rent, £514." Under Section 16, sub-section 2 of the Act any claim for compensation under the Act "shall cease to be enforceable after the expiration of two months from the termination of the tenancy unless particulars have been given by the . . . tenant to the landlord . . . before the expiration of that period." It was held by the Court of Appeal that although the particulars required need not be in writing the above claim did not give sufficient particulars to support the tenant's case. Lord Hanworth, the Master of the Rolls, in the same case stated his approval of the Scottish case of *McHarg v. Speirs* (1924, S.C. 272), where it was held that a tenant who proves that he has suffered loss by disturbance is entitled to one year's rent as compensation, even though the amount of the loss proved is less than that sum.

Olive v. Paynter (1932 2 K.B. 666; 101 L.J.K.B. 786) is another important case arising in respect of the above mentioned Act, Section 16 sub-section 2 requiring particulars of claims by the landlord against the tenant or the tenant against the landlord to be given within two months or otherwise to be unenforceable. It was held that when a claim by a landlord is one which might have been enforced under the terms of the contract of tenancy and not merely arising under the Agricultural Holdings Act, 1923, although the claim comes before an arbitrator appointed under the Act the claimant is not bound by the limitation as to time imposed by sub-section 2 of Section 16. The tenant in this case on the termination of the tenancy made a claim in respect of tenant right and the landlady counter-claimed for dilapidations for which the tenant was liable under the contract of tenancy. The two claims went to arbitration and the arbitrator stated a case for the opinion of the Court. The County Court Judge found that some particulars of the landlady's counter-claim had not been given within two months from the expiration of the tenancy, and he held that the arbitrator should entertain only those parts of that claim of which sufficient particulars were given within the two months. The Court of Appeal held that the provision in Section 16, sub-section 2, that any such claim "as is mentioned in this section" should cease to be enforceable after the expiration of two months from the termination of the tenancy unless particulars thereof have been given before the expiration of that period did not affect the landlady's rights in the arbitration against the tenant for breaches of agreement of tenancy in respect of which he had, by virtue of his agreement, a common law right of action. In this decision the Court professed to follow a former case of *Lowther v. Clifford* (1927, 1 K.B. 130 ;

95 L.J.K.B. 576) [see article on Contemporary Law in Vol. 87 of this Journal]. It is, however, difficult to reconcile this decision with the precise wording of Section 16 sub-section 2 and with the reasons given for the decision of the Court in the earlier case of *Jones v. Evans* (1923, 1 K.B. 12; 92 L.J.K.B. 35.)

In *Farrow v. Ortelwell* (49 Times L.R. 28) it was held that a purchaser of land who has not yet completed his purchase by taking a legal conveyance of the land and who is therefore merely entitled in equity to the rents and profits, not being the legal owner of the reversion, has not the right under Section 12, sub-section 1, of the Agricultural Holdings Act, 1923, to determine the tenancy by notice to the tenant to quit, but in this case the purchaser having before the expiration of the notice to quit completed his purchase and acquired the legal estate in the land and the tenant being unaware of the invalidity of the notice to quit, which was given while the landlord was only equitably entitled to the rents and profits, having taken another farm and made other preparations to his detriment for leaving the farm in respect of which notice to quit had been given it was held that the landlord was estopped from setting up the invalidity of the notice to quit and that the tenant was entitled to quit the farm and claim compensation for disturbance as if the notice had been a good one from the beginning.

In *Sanders-Jacob v. Yates* (1932, W.N. 260) a lease of a house, buildings, cottages and gardens with, paddocks and meadow ground containing 27 acres 23 poles was let to a tenant upon terms which were held to permit the premises to be used as a market garden, but it was argued that the provisions of the Agricultural Holdings Act, 1923, relating to market gardens did not apply because the whole of the premises were not let as a market garden, part being an ordinary residential house with "pleasure ground" and that the tenant had committed waste by ploughing up permanent pasture and converting into arable land. It was held that the part other than the residential house and ground was "let or treated as a market garden" within the meaning of Section 48 of the Act and that the tenant had the right so to cultivate it and plough up as he had done.

3. *Stock and Produce*.—In the Scottish case of *Henderson v. Wardrope* (1932, S.C. (J.) 18) in a prosecution for failure to give notice of the existence of swine fever in contravention of the provisions of the Diseases of Animals Act, 1894, the prosecutor produced a certificate purporting to be signed by a veterinary surgeon certifying the existence of the disease at the accused's premises. No evidence was given to prove the authenticity of the certificate, which was not attested, or to

prove that the grantor held the office of veterinary inspector under the Act. The justices having sustained an objection to the admission of the certificate as evidence, the Court of Justice held it was admissible without proof of its authenticity or of the grantor's qualifications, at all events in the absence of specific challenge on these points by the accused at the trial.

Pyatt v. Lloyd (30 L.G.R. 505; 49 Times L.R. 14) was a decision that the prohibition in Section 3, sub-section 1 (b) with regard to the use of special designations in connection with any sale or offer of sale of milk such as "Certified" "Grade A," "pasteurised," except under and in accordance with a licence granted by the Minister of Health or by his authority under the provisions of an order made by him is not limited to acts committed by persons who do not hold licences granted by the Minister. The question of prejudice to the purchaser is immaterial under this section.

4. *Marketing*.—The Agricultural Marketing Act, 1931, provides that schemes may be framed and boards constituted for the marketing and disposal of agricultural produce and by Section 5 a scheme may empower the board "to buy the regulated product, to produce such commodities from that product as may be specified in the scheme, and to sell, grade, pack, store, adapt for sale, insure, advertise and transport the regulated product." In *Rex v. Minister of Agriculture and Fisheries, ex parte Berry* (101 L.J.K.B. 561) a board elected by hop growers framed a scheme by which all hops were to be sold through their agency, and after paying expenses, etc., the money so received was to be pooled and divided amongst the growers according to the value of the produce taken from each one. It was held on an objection to the scheme, that although the Act of 1931 authorised the board to "buy" the regulated product, the taking, pooling, sale and division constituted what was in fact a purchase from the producer and a sale on his behalf, and the scheme was therefore not an infringement of the terms of the Act.

5. *Rates and Taxes*.—In *Glanely v. Wightman* (147 L.T., 466) the appellant owned a stud farm and was assessed to income tax under Schedule B in respect of the occupation of the land. He was also assessed under Schedule D in respect of fees paid for the services of his stallions. On an appeal against the assessment under Schedule D, it was held by the Court of Appeal, affirming the decision of Mr. Justice Rowlatt, that the enterprise in connection with the stallions, being separate from the ordinary enterprise attaching to the occupation of the land, was separately assessable under Schedule D.

In *Munroe & Cobley v. Bailey* (76 S.J., 761) it was held

that lands used for bulb farming were occupied as a " garden for the sale of the produce " and were not assessable as a market garden and that the profits should be assessed under Schedule D.

Carter v. Lanarkshire Assessor (1932, S.C. 382) was a Scottish case on the question of rating in which it was held in a case where there was a house of the value of £35 and lands of the value of £5 before derating, that the value of the dwelling-house being greatly in excess of the value of the lands let as a poultry farm the subjects should not be entered in the valuation roll as one and the house should not be derated as " agricultural lands and heritages." Lord Sands and Fleming, however, expressed the opinion that dwelling-houses on poultry farms necessarily solely occupied in connection with the poultry farm fell to be derated in the same manner as farm-houses.

6. *Miscellaneous.*—In *Re Jones, National Provincial Bank Ltd. v. Official Receiver* (1932, 1 Ch. 548; 101 L.J. Ch. 173) a bank advanced money to a farmer by way of overdraft before the passing of the Agricultural Credits Act, 1928, and after its passing the farmer on December 18th, 1928, executed an agricultural floating charge in favour of the bank to secure the overdraft and all moneys then owing or which might thereafter be owing on current account. On September 3rd, 1930, the bank demanded payment of the amount owing. On October 3rd a receiving order was made against the farmer, who was subsequently adjudged bankrupt. After December 31st, 1930, the bank appointed an agent to take possession of the assets charged and he accordingly sold them on January 14th, 1931. The sum then due exceeded the amount of the advance at the date of the passing of the Act, viz., August 3rd, 1928. It was held, reversing the decision of the County Court Judge, that the bank's charge was not " enforced " until after December 31st, 1930, so that Section 12 of the Agricultural Credits Act, 1928, which provides that until January 1st, 1931, where a bank has before the passing of the Act made advances to a farmer by means of an overdraft or otherwise, an agricultural charge in favour of the bank shall be enforceable only in respect of moneys advanced in addition to and in excess of a sum equal to the amount of such advance outstanding at the passing of the Act, did not apply and the bank was entitled to retain out of the products of sale the whole amount due to it as against the trustee in bankruptcy.

Stillwell v. Windsor Corporation (1932, 2 Ch. 155; 101 L.J.Ch. 342) was a case relating to trees on a highway. It was held that a highway authority has the right to cut down trees on roads which are ancient highways where those trees have become an obstruction to the public. Where those trees have become a public danger, the right to remove them becomes a

duty. By the operation of Section 149 of the Public Health Act, 1879, when roads have become repairable by the inhabitants at large of an urban district, the roads become vested in the urban authority. Consequently, as the urban authority is the highway authority, the trees growing on those roads must be treated as the property of the highway authority so as to give the authority the right to cut them down.

West Midlands Joint Electricity Authority v. Pitt (1932, 2 K.B. 1; 101 L.J.K.B. 401) was an important case relating to the assessment of compensation from an electricity authority to a landowner for wayleave over his land. By the joint effect of Section 22, sub-section 1 and Section 39, sub-section 1, of the Electricity (Supply) Act, 1919, it is for the Minister of Transport to determine whether the proposal of a "joint electricity authority or any authorised undertakers" to place an electric line over the lands of any owner who has not given his consent within 21 days from the date of service of the notice of the proposal shall be sanctioned, and also to determine what "terms, conditions and stipulations" if any, should be attached to his consent. It was held by the Court of Appeal that the power to attach terms, conditions and stipulations to such a consent does not extend to pecuniary terms, conditions or stipulations and the Minister is not empowered to assess the compensation to be paid to a landowner in accordance with Section 22, sub-section 1. Where the undertakers are a joint electricity authority created by an order under Section 7 of the Electricity (Supply) Act, 1919, the compensation is to be determined by an official arbitrator under the Acquisition of Land (Assessment of Compensation) Act, 1919. The provisions of the Land Clauses Consolidation Act, 1845, for the purchase and taking of lands otherwise than by agreement do not apply to such a case.

In *Att.-Gen. v. Corke* (1933, 1 Ch. 89; 102 L.J. Ch. 30) the defendant in return for payment allowed persons to place caravans in a disused brickfield and to live in them. Some of these persons committed in the vicinity, but not in the brickfield, acts which interfered with the comfort of people in the neighbourhood. In an action by the Attorney-General at the suit of the local district council for an injunction to restrain the defendant from permitting the brickfield to be used in such a way as to be a nuisance, it was held that as the defendant was putting his land to an abnormal use he was responsible for the nuisance which existed in the vicinity and he must be restrained from permitting the occupiers of the land to do the acts constituting the nuisance.

AUBREY J. SPENCER.

AGRICULTURAL STATISTICS, 1932.

(The Society is again indebted to the Ministry of Agriculture and Fisheries for its kindness in supplying, for inclusion in the *Journal*, the usual detailed and comparative tables of the latest Agricultural Statistics. For fuller information than can be given in the limited space available here, the Department's own admirable series of Reports on Agricultural Statistics, together with the weekly "Agricultural Market Report," should, of course, be consulted.—ED.)

I.—ACREAGE.

TABLE I gives particulars of the acreage under the principal crops in England and Wales, as returned on 4th June by occupiers of agricultural holdings above one acre in extent.

The total area of agricultural land covered by the returns was 30,555,000 acres, as compared with 30,599,000 acres in 1931, i.e., a reduction of 44,000 acres or 0.1 per cent. Crops and pasture accounted for 25,199,000 acres, or 84,000 acres less than in the preceding year, but the area returned as rough grazings increased by 40,000 acres to 5,356,000 acres. This is in accordance with the movement that has been a regular feature of post-war years, although the drop in the total area in cultivation was not so severe as between 1930 and 1931, when it amounted to 102,000 acres.

The arable area continued to decline, the 1932 total of 9,362,000 acres being 220,000 acres (2.3 per cent.) short of the previous year's figure. Between 1930 and 1931, the arable area was reduced by about 250,000 acres, so that in two years the loss has amounted to close on half a million acres. During the twelve months under review, the extent of the arable area returned as bare fallow increased by 76,000 acres to 433,000 acres, the area actually under crops (excluding clover and rotation grasses) being 126,000 acres less than in 1931. Permanent grass occupied 15,837,000 acres, or 136,000 acres more than a year earlier.

The ratio as between arable land and the total area under cultivation again showed a slight contraction of the former, which is a continuation of the trend in recent years. In pre-war years, arable land represented about 41 per cent. of the total area under crops and grass as against 37 per cent. now.

As regards the individual crops, the *Wheat* area showed an increase of 91,000 acres (7.6 per cent.) to 1,288,000 acres, but was still lower than in any other year during the present century except 1931 and was 28 per cent. below the average (1,791,000 acres) of the three years 1912-14. While the latest increase was spread over most of the country, nearly 60 per cent. of it occurred in the Eastern and North-Eastern counties.

TABLE I.—Acreage Under Crops and Grass and Numbers of Live Stock on holdings above one acre in extent as returned on the 4th June, 1932, and 4th June, 1931, in England and Wales.

Distribution.	1932. ¹	1931.	Increase (+) or Decrease (-).
	Acres.	Acres.	Acres.
Total Acreage under Crops and Grass ² .	25,199,000	25,283,000	- 84,000
Arable Land	9,862,000	9,582,000	- 220,000
Permanent Grass for Hay	4,546,000	4,778,000	- 232,000
" " not for Hay	11,291,000	10,923,000	+ 368,000
Rough Grazings	5,356,000	5,316,000	+ 40,000
Wheat	1,288,000	1,197,000	+ 91,000
Barley	963,000	1,028,000	- 66,000
Oats	1,577,000	1,652,000	- 75,000
Mixed Corn	114,200	121,900	- 7,700
Rye	24,700	32,500	- 7,800
Beans	153,400	155,200	- 4,800
Peas	126,700	132,400	- 5,700
Potatoes	503,700	446,800	+ 56,900
Turnips and Swedes	579,400	621,000	- 41,600
Mangold	229,800	270,700	- 40,900
Sugar Beet	254,800	233,200	+ 21,600
Cabbage for Fodder, Kohl Rabi and Rape	109,400	125,700	- 16,300
Vetches or Tares	43,600	64,200	- 15,600
Lucerne	39,400	46,200	- 6,800
Hops	16,600	19,500	- 2,900
Small Fruit	59,400	62,000	- 2,600
Orchards	247,100	244,800	+ 2,300
Clover, Sainfoin and Grasses under Rotation for Hay	1,538,000	1,726,000	- 188,000
Clover, Sainfoin and Grasses under Rotation not for Hay	873,000	855,000	+ 18,000
Bare Fallow	433,000	357,000	+ 76,000
	No.	No.	No.
Horses used for Agriculture ³	654,600	666,500	- 11,900
Unbroken Horses { One year and above	85,800	85,200	+ 100
Under one year	39,100	37,800	+ 1,300
Other Horses on Agricultural Holdings	137,600	149,000	- 11,400
TOTAL HORSES	916,600	938,500	- 21,900
Cows and Heifers in Milk	2,116,000	2,043,100	+ 72,900
Cows in Calf but not in Milk	851,900	821,700	+ 30,200
Heifers in Calf	402,500	425,300	- 22,800
Other Cattle { Two years old and above	938,900	938,200	+ 700
One year and under two	1,241,100	1,130,400	+ 110,700
Under one year	1,305,200	1,208,300	+ 96,900
TOTAL OF CATTLE	6,355,600	6,085,000	+ 290,600
Ewes kept for breeding	7,623,800	7,262,500	+ 361,300
Other Sheep { One year and above	2,967,600	2,783,800	+ 183,800
Under one year	7,887,200	7,702,900	+ 184,300
TOTAL OF SHEEP	18,478,600	17,749,200	+ 729,400
Sows kept for Breeding	424,500	402,400	+ 22,100
Other Pigs	2,756,500	2,380,600	+ 375,900
TOTAL OF PIGS	3,181,000	2,783,000	+ 398,000

¹ Subject to revision.² Including Mares kept for Breeding.³ Not including rough grazings.⁴ Including Stallions.

It will be recalled that the extent of land devoted to *Barley* growing was well maintained between 1930 and 1931, in contrast to the sharp falling off recorded in the two previous years. The 1932 returns, however, show that the declining tendency has re-asserted itself, the acreage being reduced by 66,000 acres (6·4 per cent.) to 963,000 acres, which is a new record low level for the crop. It may be of interest to recall that immediately before the War some 1,500,000 acres were given over to barley, and at the beginning of the century the figure was over 1,700,000 acres. Of the 66,000 acres lost to the crop during the year under review, 54,000 acres were situated in the Eastern and North-Eastern areas.

The fall in the acreage under *Oats* was greater even than with barley, the 4th June returns showing a total of 1,577,000 acres, as compared with 1,652,000 acres in 1931—or 75,000 acres (4·5 per cent.) less. This was the lowest figure ever recorded for the crop. Declines in acreage were fairly general throughout the country, Yorkshire and Norfolk exceptionally growing 4,000 acres and 2,000 acres respectively more than a year earlier.

Taken together, the three main cereal crops occupied 3,828,000 acres in 1932 as compared with 3,878,000 acres in 1931, i.e., a decline of 50,000 acres, or 1·3 per cent. In 1918, the corresponding acreage was 6,838,000 acres and ten years later, 4,343,000 acres.

Mixed Corn was grown on 114,200 acres, representing a fall of 7,700 acres (6·3 per cent.) on the year, while *Rye* occupied only 24,700 acres as against 32,500 acres in 1931, i.e., 7,800 acres, or 24·0 per cent. less. This was a record low level for the crop.

The acreage devoted to *Beans* continued to recede, although the shrinkage was much less severe than in 1931. Actually, beans for picking or cutting green increased by 1,200 acres (9·1 per cent.) to 14,400 acres, but the area harvested as corn showed a drop of 6,000 acres (4·1 per cent.) to 139,000. *Peas* also occupied a smaller acreage than on the preceding 4th June, and similarly the area for cutting green increased by 3,300 acres (5·7 per cent.) to 60,800 acres, but this was more than offset by a reduction of 9,000 acres (12 per cent.) to 65,900 acres in the area harvested as corn.

The area given over to the two pulse crops together amounted to 280,100 acres, as compared with 290,600 acres in 1931, and 310,200 acres in 1930.

A further sharp increase in the area under *Potatoes* occurred in 1932, the total of 503,700 acres being 56,900 acres (12·7 per cent.) greater than on 4th June, 1931. Thus the greater part of the loss sustained between 1929 and 1930 has been

recovered. Every county in England and Wales shared in the increase, Lincolnshire alone being responsible for an additional 9,000 odd acres. The acreage in Essex and Kent showed a rise of rather more than 4,000 acres and 3,000 acres respectively.

The progressive decline in the acreage of *Turnips* and *Sweedes* continued on much the same scale as in earlier years, the 1932 level of 579,400 acres being 41,600 acres (6·7 per cent.) below that returned in 1931. Immediately before the War, over a million acres were devoted to turnips and swedes, but by 1918 the area had fallen to 911,000 acres and by 1928 to 720,000 acres.

Mangolds, too, showed a further substantial reduction, the acreage falling by 40,900 acres (15·1 per cent.) to 229,800 acres, and being now not much more than half what it was in the early part of the century.

The combined area under the principal fodder roots in 1932 was 809,200 acres as against 891,700 acres in 1931, i.e., a drop of 82,500 acres, or 9·3 per cent. In 1918, 1,312,000 acres were grown and in 1928, 1,018,000 acres.

For the third year in succession, the area under *Hops* was reduced, falling from 19,500 acres to 16,600 acres—or by 2,900 acres (14·9 per cent.). The greater part of the shrinkage occurred in Kent, in which county the acreage returned was 8,977 acres as against 11,494 acres in the preceding year. In Hampshire the acreage fell by 231 acres (30·8 per cent.) and in Sussex by 258 acres (17·7 per cent.) but in Hereford and Worcester there were small additions. Of the total area cultivated in England, 8,977 acres (54 per cent.) were situated in Kent, 3,864 acres (23 per cent.) in Hereford, 1,828 acres (11 per cent.) in Worcester, and 1,195 acres (7 per cent.) in Sussex.

Following on an addition of 158,000 acres to the area of *Clover* and *Rotation Grasses* between 1930 and 1931, there was a reduction of 170,000 acres (6·6 per cent.) during the year under review. Of the total of 2,411,000 acres, 1,538,000 acres were shown as intended for hay, representing a fall of 188,000 acres (10·9 per cent.) on the year; the area for grazing, however, increased by 18,000 acres (2·1 per cent.) to 873,000 acres.

As regards *Sugar Beet*, the decline of 114,000 acres (32·8 per cent.) recorded on 4th June, 1931, was partially recovered in the succeeding year, the 1932 total of 254,800 acres representing an increase of 21,600 acres (9·3 per cent.). The East and North-East part of the country provided an extra 27,000 acres, Norfolk alone contributing 24,000 acres.

Many of the smaller groups of vegetables continued to expand. The acreage of *Cauliflowers* and *Broccoli* increased by 1,800 acres, *Carrots* by 3,100 acres, and *Onions* by 400

acres. There was a comparatively heavy drop of 1,800 acres in the area under *Cabbage* and of 2,700 acres in the area under *Brussels Sprouts*. In the cases of *Vetches* and *Tares*, *Lucerne* and *Mustard for Seed*, decreases of 15,600 acres (24·3 per cent.), 6,800 acres (14·7 per cent.) and 2,400 acres (10·6 per cent.) were recorded.

There was practically no change in the *Fruit* acreage, a drop of 2,600 acres in the area under small fruit being practically offset by an addition of 2,300 acres to the orchards. Kent was responsible for 1,000 acres of the additional orchard area, while Worcester and Norfolk added 600 acres and 700 acres respectively.

II.—LIVE STOCK.

It may be recalled that the increase in the total numbers of *Cattle* (Table I) in 1931 was the first to be shown since 1927. During the year under review the herds were augmented by a further 290,600 (4·8 per cent.), the total of all cattle on 4th June being 6,355,600, which is the largest number ever recorded. Cows and heifers in milk showed an increase of 72,900 (3·6 per cent.) to 2,116,000, and cows in calf but not in milk of 30,200 (9·4 per cent.) to 351,900. There was, however, a reduction of 22,800 (5·4 per cent.) in the numbers of in-calf heifers, and the net result of these changes in the dairy herds was to bring the total to 2,870,400—a record high level. There were heavy increases of 110,700 (9·8 per cent.) and 96,900 (8 per cent.) respectively in “other” cattle aged one year and under two, and in calves. Cattle of two years and over were little altered at 938,900. Most of the English counties actually showed decreases, but these were more than counter-balanced by gains in all the Welsh counties.

For the third year in succession, the numbers of *Sheep* showed a substantial increase, the total recorded being 18,478,600 as compared with 17,749,200 in 1931—or 729,400 (4·1 per cent.) more. This figure was higher than in any year since 1911. Breeding ewes accounted for almost one-half of the total increase, the numbers rising by 361,300 (5 per cent.) to 7,623,000. “Other” sheep of one year and above advanced by 183,800 (6·6 per cent.) to 2,967,600, but the gain in lambs was relatively much less pronounced at 184,300 (2·4 per cent.) to 7,887,200. The increases were confined to England, Welsh flocks showing a net decrease.

The numbers of *Pigs* on agricultural holdings were greater in 1932 than in any other year with the exception of 1924. As compared with 1931 there was an increase of 398,000 (14·3 per cent.), the total being 3,181,000. (The number of sows kept for breeding increased by 22,100 (5·5 per cent.), whereas

the increase in "other pigs" was 375,900 (15·8 per cent.), to which practically every area other than North Wales, where there was a very slight decline, contributed.

Once again the statistics of *Horses* on agricultural holdings showed a decline, the numbers falling from 938,500 to 916,600, or by 21,900 (2·3 per cent.). In 1918 there were 1,376,000 horses on farms and by 1921 the figure had increased to 1,385,000. Since then, however, a steady and persistent reduction has been in evidence. The drop of 21,900 during the period under review was shared almost equally by horses used for agricultural purposes, which showed a decline of 11,900 (1·8 per cent.) to 654,600, and "other" horses, which fell by 11,400 (7·7 per cent.) to 137,600. The numbers of unbroken horses aged one year and above were practically unchanged, while foals, which had previously shown an almost uninterrupted fall since 1919, increased by 1,300 (3·4 per cent.) to 39,100.

The numbers of *Fowls* kept on agricultural holdings increased by a further 10 per cent.—from 52,564,000 to 57,734,000. There has been a steady annual growth of about 5,000,000 head during the past three years, and the latest total is practically double that recorded in 1913. Nearly one-quarter of the fowls are to be found in Lancashire and Yorkshire. *Ducks* numbered 2,632,000 on 4th June, 1932, as compared with 2,494,000 in 1931, i.e., an increase of 138,000 or 6 per cent. Older birds were more numerous in almost all counties except Berkshire, where a decline of 500 was recorded, but in nearly half the counties the figures of young ducks were smaller than a year earlier. For the first time since 1927, the numbers of *Geese* returned showed a rise, the total being 573,000 as against 551,000 in 1931. There were 34 per cent. more birds in Norfolk. The *Turkey* population advanced from 529,000 head to 553,000 head, or by 24,000 (4·5 per cent.).

III.—PRODUCE OF CROPS.

Figures of the production and yield per acre of the principal crops are shown in Table II.

At 17·2 cwt. per acre, the *Wheat* crop yielded much better than in 1931, and was within 0·1 cwt. of the average of the ten preceding years. Yields as a rule were below average in the principal wheat-growing areas, but in many other localities were above average. With an additional 91,000 acres under the crop, the total production was estimated at 1,105,000 tons as compared with 961,000 tons in 1931, i.e., an increase of nearly 145,000 tons, or 15 per cent.

Barley also did very well, yielding 16·0 cwt. to the acre as against 15·0 cwt. in 1931 and a ten-year average of 15·6 cwt. Even so, this good yield was not sufficient to counteract the

TABLE II.—Estimated Total Produce and Yield per Acre of the Corn, Hay and Root Crops in England and Wales in 1932, with Comparisons for 1931, and the Average Yield per Acre of the Ten Years 1922 to 1931.

Crops.	Estimated Total Produce.		Acreage.		Estimated Yield per Acre.		
	1932.*	1931.	1932.*	1931.	1932.*	1931.	Average of the Ten Years 1922-31.
	Thousands of Cwt.	Thousands of Cwt.	Acres.	Acres.	Cwt.	Cwt.	Cwt.
Wheat . . .	22,092	19,230	1,237,908	1,196,697	17.2	16.1	17.3
Barley . . .	15,342	15,457	960,530	1,029,141	16.0	15.0	15.6
Oats . . .	25,018	24,786	1,580,010	1,651,606	15.8	15.0	14.9
Mixed Corn . .	1,841	1,688	113,640	121,069	16.2	13.9	15.0
Beans . . .	2,363	2,403	133,555	144,953	17.1	16.6	16.3
Peas . . .	893	1,046	65,767	74,918	13.6	14.0	14.2
	Thousands of Tons	Thousands of Tons					
Seeds Hay ¹ . .	2,176	2,608	1,538,265	1,726,444	23.3	30.2	28.1
Meadow Hay ² .	4,662	5,617	4,546,685	4,777,843	20.5	22.3	20.5
					Tons	Tons	Tons
Potatoes . . .	3,303	2,454	504,275	446,772	6.6	5.5	6.3
Turnips and Swedes . .	7,535	6,978	573,047	613,753	13.0	11.8	12.6
Mangolds . . .	4,336	4,529	229,164	269,665	18.9	16.8	19.1

* Hay from Clover, Sainfoin and Grasses under rotation.

¹ Hay from Permanent Grass.

² Subject to revision.

effect of the heavy drop in acreage, and the total production was about 5,700 tons less on the year at 767,000 tons, which is the lowest figure recorded during the past twenty years, with the exception of 1930.

In the case of *Oats*, yields were more satisfactory than in the preceding year in most districts, and the average yield for the whole country was estimated at 15.8 cwt. per acre as compared with 15.0 cwt. in 1931 and 14.9 during the ten years 1922-31. In spite of a fall of over 60,000 acres in the area devoted to the crop, the out-turn amounted to 1,251,000 tons—or 12,000 tons more on the twelve months.

Taking the three main cereal crops together, the total production was in the neighbourhood of 3,122,000 tons as against 2,973,000 tons in 1931, i.e., 149,000 tons (5 per cent.) more. The corresponding total for 1918 was 5,500,000 tons.

The yield of *Beans*, at 17.1 cwt. to the acre, was a particularly good one, being 0.5 cwt. greater than in 1931 and 0.8 cwt. above the ten-year average. There were some 6,000 acres

less harvested, however, and the total yield of 118,000 tons showed a fall of 2,000 tons (nearly 2 per cent.).

Peas fared very badly, yielding only 13·6 cwt. per acre as compared with 14·0 cwt. in 1931 and a ten-year average of 14·2 cwt. The yield was, in fact, the lowest recorded since 1927, when it was 13·2 cwt. per acre. With the area harvested reduced by over 9,000 acres, the total output of peas was less than 45,000 tons.

In contrast to 1931, when the yield of *Potatoes* was particularly poor, weather conditions during the year under review were very favourable, and resulted in an over-average yield of 6·6 tons per acre, in which nearly all counties participated. This, coupled with the sharp rise of 57,000 acres in the area planted, caused the total production of potatoes to increase by as much as 850,000 tons to 3,308,000 tons, which is 228,000 tons greater than the average out-turn for the previous ten years.

At 13 tons to the acre, *Turnips and Swedes* yielded better than for some few years past and 0·4 ton over the ten-year average. The total production amounted to 7,535,000 tons as compared with 6,978,000 tons in 1931, i.e., an increase of 557,000 tons (8 per cent.). But for the good yield, the output of turnips and swedes in 1932 would have been remarkably low, since the acreage declined by over 40,000 acres.

The yield of *Mangolds* was estimated at 18·9 tons to the acre, or as much as 2·1 tons above the previous year's figure. It was, nevertheless, slightly below average. Consequent upon a fall of close on 41,000 acres in the area under the crop, production declined, however, by 193,000 tons (4 per cent.) to 4,336,000 tons.

Like the other root crops, *Sugar Beet* did comparatively well during the year under review, yielding about 8·4 tons to the acre as compared with 7·1 tons in 1931. On an area of nearly 255,000 acres, it is estimated that the total production of washed and topped beets will be over two million tons.

On the whole, weather conditions for the *Hay* harvest were not unfavourable, and most of the carting was completed by the end of August. The yield of seeds hay, at 28·3 cwt. per acre, was 0·2 cwt. in excess of the ten-year average, but 1·9 cwt. below the 1931 level, and resulted in a total out-turn of 2,176,000 tons, as compared with 2,608,000 tons in 1931. In the case of meadow hay, the yield of 20·5 cwt. to the acre was exactly the same as the ten-year average, but 1·8 cwt. below the previous year's yield. Production totalled 4,662,000 tons, or about 650,000 tons less on the year.

As regards *Hops* (See Table III) only about 200 acres were left unpicked as compared with 1,600 acres in 1931, and the

TABLE III.—Hops :—Total Production in the years 1932 and 1931, with the Acreage and Yield per Statute Acre in each County of England in which Hops were grown; and the Average Yield per Acre of the Ten Years 1922 to 1931.

Counties, etc.	Acreage.		Estimated Total Produce.		Estimated Yield per Acre.		
	1932. ¹	1931.	1932. ¹	1931.	1932. ¹	1931.	Average of the Ten Years 1922-31.
	Acres.	Acres.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
TOTAL FOR ENGLAND .	16,531	19,528	188,000	189,000	11.4	8.7	12.2
Kent { East . . .	1,921	2,556	28,300	28,800	14.7	11.1	14.0
Mid . . .	2,549	3,550	31,800	30,500	12.5	8.6	13.6
Weald . . .	4,507	5,388	55,300	58,000	12.3	9.8	12.3
Total, Kent .	8,977	11,494	115,400	111,800	12.9	9.7	13.1
Hants . . .	520	751	7,000	2,800	13.3	3.7	11.0
Surrey . . .	83	146	800	800	9.6	2.3	11.0
Sussex . . .	1,195	1,453	13,900	13,300	11.6	9.1	12.5
Hereford . . .	3,864	3,817	32,300	28,300	8.4	7.4	10.2
Worcester . . .	1,328	1,811	17,800	11,900	9.7	6.6	9.4
Other Counties ² .	64	56	800	600	11.5	10.8	9.6

¹ Subject to revision.

² Salop, Gloucestershire and Berkshire.

yield per acre, at 11.4 cwt., was as much as 2.7 cwt. greater on the year, although close on 1 cwt. below the average of 1922-1931. All the hop-growing areas returned improved yields, Hampshire being outstanding with 13.3 cwt. per acre as against only 3.7 cwt. in the preceding year. Actually, the highest yield was in East Kent, with 14.7 cwt. per acre. On an area reduced by about 3,000 acres, production rose by 19,000 cwt. to 188,000 cwts. Of the total output, Kent contributed 115,400 cwt. (61 per cent.), Hereford 32,300 cwt. (17 per cent.), Worcester 17,800 cwt. (9 per cent.), Sussex 13,900 cwt. (7 per cent.) and Hampshire 7,000 cwt. (4 per cent.).

IV.—PRICES.

In view of the fact that it was desired to send the *Journal* to press this year earlier than usual it has not been possible to include comments on all the groups of annual prices, since they were not available in time. This section of the article is therefore confined to a brief survey of the course of prices during the greater part of 1932.

Tables IV and V give the percentage increases or decreases in the prices of agricultural produce, for individual items and collectively.

TABLE IV.—Percentage Increase or Decrease in the Monthly Prices of Individual Descriptions of Agricultural Produce during the Year 1932, as compared with the Corresponding Month of 1911-13.

Commodity.	Month.												Year.
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
Wheat . . .	-20 ¹	-24 ¹	-19 ¹	-21 ¹	-23 ¹	-20 ¹	-21 ¹	-20 ¹	-24 ¹	-25 ¹	-28 ¹	-28 ¹	-22 ¹
Barley . . .	8	1	4	1	-7 ¹	-7 ¹	-6 ¹	-10 ¹	8	-5 ¹	-14 ¹	-16 ¹	-4 ¹
Oats . . .	2	2	5	5	7	7	1	6	-4 ¹	-10 ¹	-15 ¹	-19 ¹	-1 ¹
Fat Cattle . .	19	19	21	18	20	18	17	18	12	2	1	1	15
„ Sheep . . .	10	Nil	Nil	8	7	7	-3 ¹	-10 ¹	-14 ¹	-17 ¹	-18 ¹	-9 ¹	-8 ¹
Bacon Pigs . .	-4 ¹	-5 ¹	-3 ¹	Nil	8	-9 ¹	-12 ¹	-14 ¹	-16 ¹	-18 ¹	-15 ¹	-8 ¹	-9 ¹
Pork Pigs . . .	10	6	9	9	6	-9 ¹	-14 ¹	-18 ¹	-18 ¹	-12 ¹	-8 ¹	3	-2 ¹
Dairy Cows . .	28	21	20	19	18	16	12	10	12	15	17	14	17
Store Cattle . .	21	28	21	15	15	15	13	13	9	Nil	-3 ¹	3	14
„ Sheep . . .	Nil	-4 ¹	-9 ¹	-11 ¹	-11 ¹	-2 ¹	-10 ¹	-19 ¹	-20 ¹	-28 ¹	-30 ¹	-28 ¹	-14 ¹
„ Pigs . . .	27	14	5	4	Nil	-15 ¹	-16 ¹	-14 ¹	-14 ¹	-11 ¹	-5 ¹	3	-1 ¹
Eggs . . .	7	2	4	7	-3 ¹	2	14	15	24	21	12	-8 ¹	9
Poultry . . .	27	28	23	27	36	32	19	17	24	26	21	15	28
Milk . . .	54	46	17	50	37	37	48	48	50	45	52	55	44
Butter . . .	8	7	7	11	8	-4 ¹	4	Nil	-6 ¹	-5 ¹	-3 ¹	-2 ¹	2
Cheese . . .	22	32	33	39	43	53	81	25	16	14	15	14	27
Potatoes . . .	203	175	164	189	145	113	34	6	14	20	23	20	97
Hay . . .	-25 ¹	-28 ¹	-30 ¹	-32 ¹	-30 ¹	-31 ¹	-34 ¹	-32 ¹	-31 ¹	-33 ¹	-33 ¹	-33 ¹	-31 ¹
Wool (at Bradford) . .	-20 ¹	-22 ¹	-24 ¹	-31 ¹	-33 ¹	-43 ¹	-42 ¹	-39 ¹	-38 ¹	-38 ¹	-38 ¹	-38 ¹	-55 ¹ , ²

¹ Decrease.² At Country Wool Sales.

TABLE V.—Percentage Increase in the Monthly and Yearly Prices of Agricultural Produce as a whole in each Year from 1923 to 1932 as compared with the Corresponding Periods 1911-13.

	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.
January . . .	67	60	71	58	49	45	45	48	30	22
February . . .	63	61	69	53	45	43	44	44	26	17
March . . .	59	57	66	49	43	45	43	39	23	13
April . . .	54	53	59	52	43	51	46	37	23	17
May . . .	54	57	57	50	42	54	44	34	22	15
June . . .	49	56	53	48	41	53	40	31	23	11
July . . .	50	53	49	43	42	45	41	34	21	6
August . . .	52	57	54	49	42	44	52	35	21	5
September . . .	52	61	55	55	43	44	52	42	20	4
October . . .	50	66	53	48	40	39	42	29	13	Nil
November . . .	51	66	54	48	37	41	44	29	12	1
December . . .	55	65	54	46	38	40	43	26	17	3
Year . . .	57	61	59	51	44	47	44	34	20	12

TABLE VI.—Average Prices of British Corn per cwt. (of 112 Imperial Standard lb.)¹ in England and Wales as ascertained under the Corn Returns Act, 1882, and the Corn Sales Act, 1921, in each week of the year 1932.

1932. Received in the week ended		Wheat.	Barley.	Oats.
		s. d.	s. d.	s. d.
January	2	6 0	8 3	6 11
"	9	6 0	8 5	6 11
"	16	5 10	8 2	6 11
"	23	5 10	8 3	7 2
"	30	5 9	8 4	7 2
February	6	5 8	8 2	7 3
"	13	5 7	8 3	7 3
"	20	5 8	8 3	7 3
"	27	5 9	8 1	7 5
March	5	5 11	8 2	7 5
"	12	6 1	8 6	7 5
"	19	6 1	8 3	7 5
"	26	6 1	8 1	7 5
April	2	6 1	7 11	7 5
"	9	6 0	8 0	7 3
"	16	5 11	7 10	7 5
"	23	6 0	7 10	7 6
"	30	6 0	7 5	7 7
May	7	6 1	7 4	7 10
"	14	6 1	7 2	8 0
"	21	6 2	7 4	8 0
"	28	6 3	7 1	8 0
June	4	6 3	7 4	8 0
"	11	6 5	6 7	8 1
"	18	6 5	6 9	8 1
"	25	6 5	7 1	8 1
July	2	6 5	6 10	7 10
"	9	6 6	6 8	8 0
"	16	6 5	6 11	7 11
"	23	6 6	8 8	7 10
"	30	6 5	6 8	7 6
August	6	6 7	6 8	7 10
"	13	6 7	6 9	7 7
"	20	6 7	6 9	7 6
"	27	6 2	7 5	6 11
September	3	5 9	8 2	6 7
"	10	5 8	8 6	6 7
"	17	5 8	9 2	6 6
"	24	5 8	8 9	6 6
October	1	5 7	9 1	6 5
"	8	5 8	7 11	6 3
"	15	5 8	7 11	6 3
"	22	5 7	7 9	6 3
"	29	5 7	7 10	6 2
November	5	5 6	7 7	6 0
"	12	5 6	7 7	5 11
"	19	5 5	7 8	5 11
"	26	5 5	7 2	5 10
December	3	5 5	6 11	5 9
"	10	5 4	6 11	5 9
"	17	5 3	7 0	5 8
"	24	5 4	6 11	5 9
"	31	5 3	7 1	5 9
Average for the year		5 11	7 7	7 9

¹ Section 8 of the Corn Returns Act, 1882, as amended by Section (2) of the Corn Sales Act, 1921, provides that in the weekly summary of quantities and prices each sort of British Corn shall be computed with reference to the hundredweight of one hundred and twelve imperial standard pounds.

It will be seen that far from showing any signs of recovery, agricultural prices became more depressed than ever during the year under review. True, the customary increase in the index number occurred in January, but thereafter the tendency became distinctly weaker. By June, prices stood at only 11 per cent. above pre-war, as compared with 23 per cent. in the corresponding month of 1931, and subsequently what little hope there had been of a check in the downward movement completely evaporated, for by persistent declines prices fell in October to precisely the 1911-13 level. At the corresponding period of 1931, the index stood at 13 per cent. above pre-war.

On the whole, prices of potatoes and dairy produce maintained a comparatively good level, but towards the end of the year practically all other descriptions of farm produce became cheaper than before the War.

Grain.

The average prices of *British Corn* during each week of 1932 are shown in Table VI and the annual averages since 1922 in Table VII.

TABLE VII.—Annual Average Prices *per cwt.* (of 112 Imperial Standard lb.) of British Wheat, Barley and Oats in England and Wales in each Year from 1922 to 1932, as ascertained under the Corn Returns Act, 1882, and the Corn Sales Act, 1921.

Year.	Annual Average Price per cwt.		
	Wheat.	Barley.	Oats.
	s. d.	s. d.	s. d.
1922	11 2	11 2	10 5
1923	9 10	9 5	9 7
1924	11 6	13 1	9 9
1925	12 2	11 9	9 9
1926	12 5	10 4	9 0
1927	11 6	11 9	9 1
1928	10 0	11 0	10 5
1929	9 10	9 11	8 10
1930	8 0	7 11	6 2
1931	5 9	7 11	6 3
1932	5 11	7 7	7 0

Wheat commanded rather better prices than in 1931 during practically the whole of the first nine months of the year, the new crop coming on to the market at an appreciably higher level in September than in the corresponding week of 1931. A distinctly weak tendency asserted itself in the autumn and winter months, however, when prices were substantially below those ruling a year earlier. The average for the year came out at 5s. 11d. per cwt. as compared with 5s. 9d. in 1931 and 8s. in 1930.

Although subject to rather more irregularity, the course of *Barley* prices was, on the whole, much the same as with *Wheat*. The falling off, however, began earlier and the disparity between the two sets of figures was much greater at that period. At no time during the closing two months of the year did the average price rise above 7s. 7d. per cwt. whereas in the corresponding weeks of 1931 the lowest average was 8s. 3d. per cwt. The annual figure for 1932 was 7s. 7d. per cwt. as against 7s. 11d. in 1931.

Oats were 9d. per cwt. dearer at an average of 7s. per cwt., prices being higher than in 1931 during the greater part of the year. Here again, weakness developed in the closing months.

Live Stock.

Table VIII gives the monthly prices of certain descriptions of fat and store stock during 1932, and Table IX the annual figures back to 1923.

Fat Cattle recovered somewhat at the beginning of the year under review, and prices showed no undue fluctuation until September, when the index figure fell to 12 per cent. above pre-war. In the ensuing month a severe drop of 10 points occurred and the year closed with cattle fetching only 1 per cent. more than in 1911-13, as compared with 10 per cent. more in December, 1931.

In the case of *Fat Sheep*, the decline in values was intense. The year commenced with a figure of 10 per cent. above pre-war as against 50 per cent. at the corresponding period of 1931, and ended with prices 9 per cent. below the 1911-13 level. October was the worst month at 17 per cent. below pre-war.

Bacon Pigs were cheaper than in 1911-13 for almost the entire twelve months, while *Porkers* dropped to below the base level in June, and remained thus until December, when the index number rose to 3 per cent. above pre-war.

Dairy Cows maintained a comparatively fair level of prices, the worst month being August, with a figure of 10 per cent. above 1911-13. *Store Cattle* experienced a slump in the autumn and winter.

TABLE VIII.—Monthly average Prices of Certain Descriptions
of Fat and Store Stock in England and Wales during the
Year 1932.

Description.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
FAT CATTLE: Shorthorns, Devons and Herefords, 2nd quality, weighted FAT COWS, 2nd quality . .	Per live cwt.												
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.
	40	5 41	1 42	5 43	3 44	4 43	11 41	6 40	0 37	5 34	2 33	11 36	2 39 11
DAIRY COWS: Mean of 1st and 2nd quality Shorthorn milk- ers and in-calvers . .	Per head.												
	£	s.	£	s.	£	s.	£	s.	£	s.	£	s.	£
	24	17 24	7 23	9 23	9 23	6 22	16 22	8 22	3 22	19 24	4 24	4 23	17 23 9
VEAL CALVES: 2nd quality	Per lb.												
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
	10½	10½	11½	11	11	10½	9½	9½	8½	7½	8	8½	9½
FAT SHEEP, 2nd quality: Downs and Longwools, weighted	Per lb.												
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
	8½	8	8½	8½	8	7½	7	6½	6½	6	6½	7½	7½
FAT PIGS, 2nd quality: Baconers Porkers Sows	Per score lb.												
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.
	9	1 9	8 9	8 10	0 10	2 8	11 8	8 8	10 8	7 8	5 8	8 9	8 9 1
STORE PIGS: Mean of 1st and 2nd quality 8-12 weeks and 12-16 weeks old stores	Per head.												
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.
	26	7 25	10 25	3 24	9 24	3 20	1 19	2 19	7 19	9 19	10 20	4 23	6 22 5

TABLE IX.—Yearly Average Prices of Certain Descriptions of Fat and Store Stock in England and Wales during the Years 1923–32.

Description.	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.
FAT CATTLE : Shorthorns, Devons and Herefords, 2nd qual- ity, weighted . . . FAT Cows, 2nd quality . .	Per live cwt.									
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
	52 5 53 46 0 38	2 52 1 38	7 49 2 33	0 44 0 29	3 48 5 33	1 46 0 31	5 46 8 31	2 42 6 27	7 89 5 24	11 46 4 24
DAIRY COWS : Mean of 1st and 2nd quality Shorthorn milkers and in-calvers	Per head.									
	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
	81 2 31	9 29 16 27	15 25 10 26	9 26 6 26	3 25 6 23	9 26 6 26	3 25 6 23	9 26 6 26	3 25 6 23	9 26 6 23
VEAL CALVES : 2nd quality . . .	Per lb.									
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
	11½	11½	11½	11½	11	11½	11½	12	11½	9½
FAT SHEEP, 2nd quality : Downs and Longwools weighted . . .	Per lb.									
	d.	d.	d.	d.	d.	d.	d.	d.	d.	d.
	14	14	13½	11½	11½	12½	11½	12	10	7½
FAT PIGS, 2nd quality : Baconers . . . Porkers . . . Sows . . .	Per score lb.									
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
	15 9 13 18 1 14	4 16 9 17	4 18 5 19	0 14 6 16	5 13 5 14	5 15 8 17	11 15 6 17	4 10 6 13	8 9 0 10	1 18 4 24
STORE PIGS : Mean of 1st and 2nd quality 8-12 weeks and 12-16 weeks old stores . . .	Per head.									
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
	50 2 31	4 26 10 52	0 42 4 29	11 40 10 43	8 24 5 28	5 28 5 28	5 28 5 28	5 28 5 28	5 28 5 28	5 28 5 28

Store Sheep became fantastically low in price towards the end of the twelve months, and in November were selling at actually 30 per cent. less than in 1911-13; at the corresponding period of 1931, store sheep were averaging 12 per cent. more than pre-war.

As regards *Store Pigs*, the year opened with the index number 27 per cent. above the level of the base years, but prices gradually fell away until in July the average was 16 per cent. below 1911-13. There was some recovery later.

Dairy and Poultry Produce.

The index for *Eggs* was very low during the first six months of the year, but unlike most other products, they occupied a much stronger position in the autumn; in November, however, a sharp decline occurred, and December witnessed something in the nature of a slump, eggs then selling at an average of 8 per cent. less than in 1911-13.

The *Milk* index was fairly stable except in March. *Butter* was very cheap, realising less than in pre-war years from September onwards. The index numbers for *Cheese* during 1932 were appreciably higher than in 1931.

Other Commodities.

Potato prices showed an even wider range than in the preceding year; old crop sold at extremely good figures, but there was a severe decline when the new crop came on to the market. In August, the index number stood at only 6 per cent. above 1911-13, but the year ended with a level of 20 per cent. above.

Values for *Hay* showed comparatively little variation at around 30 per cent. under pre-war. Although prices were under the 1911-13 level throughout 1931, during no month in that year had they fallen below 23 per cent. less.

Feeding Stuffs.

Although most descriptions of feeding stuffs were cheaper than pre-war during a considerable part of 1932, the level was generally higher than in 1931. (See Tables X and XI.)

Imported *Feeding Barley* in January cost on average 4 per cent. less than in the base period, but a weaker tendency was in evidence later in the year, and by December the average had declined to 15 per cent. under pre-war, as compared with 8 per cent. below in December, 1931.

Prices for *Imported Oats* were rather above pre-war levels up to July, but thereafter were below, the index number in December being 10 per cent. under 1911-13.

TABLE X.—Percentage Increases or Decreases in the Monthly Prices of Certain Descriptions of Feeding Stuffs during the Year 1932 as compared with the corresponding months of 1911-13.

Description of Feeding Stuff.	Month.											
	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Imported Barley . . .	-4 ¹	-5 ¹	4	-8 ¹	-7 ¹	-9 ¹	-9 ¹	-4 ¹	-12 ¹	-21 ¹	-16 ¹	-15 ¹
Imported Oats . . .	6	5	14	7	5	6	4	-1 ¹	-6 ¹	-12 ¹	-12 ¹	-10 ¹
Maize . . .	-25 ¹	-20 ¹	-14 ¹	-17 ¹	-20 ¹	-25 ¹	-20 ¹	-16 ¹	-21 ¹	-24 ¹	-22 ¹	-24 ¹
Milling Offals . . .	11	19	23	22	24	16	10	8	5	8	6	8
Oilcakes . . .	-1 ¹	-3 ¹	-3 ¹	-7 ¹	-7 ¹	-7 ¹	-7 ¹	Nil	-2 ¹	-3 ¹	-6 ¹	-3 ¹
Brewers' Grains . . .	2	Nil	-1 ¹	4	6	6	7	8	1	-2 ¹	-2 ¹	2
Maize and Barley Meal . . .	-9 ¹	-6 ¹	-1 ¹	-5 ¹	-8 ¹	-18 ¹	-14 ¹	-11 ¹	-16 ¹	-19 ¹	-17 ¹	-18 ¹

¹ Decrease.

TABLE XI.—Percentage Increases or Decreases in the Yearly Prices of Certain Descriptions of Feeding Stuffs and Fertilisers in each year from 1923 to 1932, as compared with the average of the Three Years 1911-13.

Description.	Year.										
	1923.	1924.	1925.	1926.	1927.	1928.	1929.	1930.	1931.	1932.	
Imported Barley . . .	15	49	44	22	48	47	20	-20 ¹	-29 ¹	-9 ¹	
Imported Oats . . .	35	35	46	30	42	52	25	-11 ¹	-12 ¹	2	
Middlings . . .	23	44	33	15	38	39	18	-13 ¹	-12 ¹	1	
Bran . . .	35	57	54	29	59	63	43	4	8	25	
Maize Meal . . .	45	58	53	27	27	55	45	5	-23 ¹	-13 ¹	
Barley Meal . . .	24	52	43	26	46	45	26	-15 ¹	-19 ¹	-4 ¹	
Linseed Cake . . .	42	53	52	39	36	46	53	20	-2 ¹	-4 ¹	
Cotton Seed Cake (English)	37	56	51	19	23	53	40	-2 ¹	-4 ¹	-1 ¹	
Cotton Seed Cake (Egyptian)	35	51	45	12	22	48	37	-9 ¹	-13 ¹	-7 ¹	
Maize . . .	52	67	67	28	35	67	56	4	-30 ¹	-21 ¹	
Dried Ale Grains . . .	32	47	54	22	29	54	49	-6 ¹	-17 ¹	2	
General Index No. . .	36	54	52	25	39	54	39	-4 ¹	-17 ¹	-5 ¹	
Nitrate of Soda (N.15½ per cent.) . . .	28	30	23	24	20	1	-7 ¹	-10 ¹	-15 ¹	-20 ¹	
Basic Slag (P.A. 14 per cent.) . . .	40	12	16	40	46	19	19	22	24	26	
Superphosphate (S.P.A. 18½ per cent.) . . .	30	28	23	15	12	3	14	13	13	5	
Sulphate of Ammonia (N. 20.6 per cent.) . . .	2	-4 ¹	-13 ¹	-19 ¹	-26 ¹	-32 ¹	-34 ¹	-37 ¹	-37 ¹	-59	
Kainit (14 per cent. potash) . . .	-20 ¹	-12 ¹	2	12	12	20	22	23	21	33	
General Index No. . .	23	19	14	12	10	-2 ¹	Nil	1	-4 ¹	-10 ¹	

¹ Decrease.

Maize continued to be very cheap throughout the year, but prices of *Milling Offals* were maintained at a comparatively high level until the Autumn.

Oilcakes were fairly stable at around 5 per cent. under pre-war. *Brewers' Grains*, too, did not show much alteration during the year, the index figure being considerably higher than in 1931.

The decline in prices of *Meals* was more or less progressive from March onwards, and the year closed with the composite index figure standing at 18 per cent. below 1911-13.

R. E. STANLEY.

52, Culmstock Road,
Clapham Common, S.W. 11.

BOOKS OF THE YEAR.

DURING the past few years anxiety about the state of British agriculture, and concern for its future, have spread from the farming community to the general mass of the people. It is, therefore, not surprising that the year has produced a large number of books which discuss the position of the industry, attempt to discover the root causes of its ills, and examine the principles upon which should be founded our national agricultural policy.

Perhaps the most fundamental of all the questions is that which concerns the main object of such policy. There are three possible points of view. It may be argued that a sufficient aim is that of placing farming again upon a reasonably profitable basis—of ensuring a living to the efficient farmer and of enabling him to continue to employ, at current wage rates, his present number of workers. Again it may be maintained that effort should be directed primarily to an increase in the home production of food, in order to improve the balance of our trade and so enable the country to become less dependent upon the export of manufactured goods, which world conditions are making more and more difficult. And lastly there is the view that the problem of our unemployed overshadows all others and hence that the absorption by agriculture of some proportion of the workless should be our chief aim.

Apart from these aspects there is the question of the lines upon which farming should be encouraged to develop. British farming is not one industry but many. Should we direct help mainly to those branches which are most depressed, or let these branches die and lend a hand to those others which are more nearly on a paying basis?

The relative importance of the different possible objectives, the question of how far they are compatible one with another, and the means by which they can be achieved, constitute, along with the mass of incidental problems, the subject matter of much of the year's agricultural writings.

Land and Life,¹ by Viscount Astor and K. A. H. Murray, is in part, and quite frankly, a piece of special pleading. Briefly the argument is that this country as a whole is pre-eminently suited to live stock production in a variety of forms, and but ill adapted to corn-growing; that the free play of economic forces has for years been tending to drive the farmer away from the traditional systems of arable farming and into such branches as dairying, poultry keeping and meat production; that economic forces will, so far as can be foreseen, tend to produce the same trend in the future; and that, therefore, any assistance which the Nation can give to agriculture should be devoted, not to the bolstering up of decaying systems, but to making possible the change over to other branches which have a real chance of becoming permanently self-supporting. It follows that the authors are whole-heartedly opposed, on principle, to the sugar beet subsidy and the wheat quota, both of which are subjected to merciless criticism. Many alternative suggestions are put forward for the more profitable investment of the money which a continuance of these measures must cost.

Whether or not one accepts the authors' main conclusions, the book must be regarded as a very valuable contribution to the solution of the agricultural problem, for it contains a great deal of accurate information about the recent changes and present position of British agriculture, carefully arranged and very clearly set forth. The handling of statistics is done with quite remarkable skill.

Sir John Russell has added to his many services to British agriculture by setting forth the broad problems that confront the country and the Empire in relation to agriculture and the food supply. His book, *The Farm and the Nation*,² is written in simple language, with a studious avoidance of the technicalities either of farming or science or economics. It should thus prove a valuable guide to the townsman who feels, as many undoubtedly do, that he can no longer remain unconcerned about these things. The earlier chapters, which deal with the recent history of our home agriculture, with the use that we make of our land and with the results of our efforts in terms of the Nation's food, contain a good deal that will be common knowledge to farmers and countrymen, but they provide just

¹ London: Victor Gollancz Ltd. ² London: Faber and Faber.

that basis of knowledge that the ordinary citizen must have before he can attempt to form a reasonable judgment. The corresponding chapters on the Empire overseas can hardly fail to interest a reader of either class, for there is probably nobody alive who has a wider or more intimate first-hand knowledge of our Empire's farming than the author. His examination of the question how far, in regard to each of the main kinds of agricultural produce, the Empire could become self-supporting is of special value. In certain cases, as for example beef and bacon, Sir John seems inclined to think that action based upon the narrow nationalist view, and aimed simply at "keeping out the foreigner," might do more harm than good. In his penultimate chapter he considers broadly the possibilities of improving production, of finding new forms of output, of reducing waste, of market reorganisation and so forth. Here he puts very clearly the three options of increased production, a better living for the agricultural classes or more employment on the land; "The three purposes," he says, "are quite distinct; one could aim at any one of them with some chance of success, but to aim at all three probably means missing them all." Finally he considers the human problem of the displacement of men which is resulting from the farmer's efforts to cheapen production by mechanisation and other means.

The book does not pretend to be specially profound or strikingly original, but it is well balanced, dispassionate and full of plain truth and common sense.

Still wider in its scope, and delving much deeper into economic questions, is *World Agriculture: an International Survey*,¹ which is the report of a study group of members of the Royal Institute of International Affairs, under the Chairmanship of Viscount Astor. The book contains the opinions, upon various aspects of the agricultural crisis, of a great number of acknowledged authorities and is reinforced at every point with the best available statistical information.

Agriculturists constitute about two-thirds of the whole population of the globe, and during the past three years the vast majority of them have been falling into ever deeper distress owing to the general collapse of the prices of the things which they produce. The first part of the book is devoted to a discussion of the causes of this phenomenon. That there has been over-production in one sense—i.e., in relation to the effective demand—is sufficiently clear, for the accumulation of stocks and surpluses of agricultural produce has been a marked feature of recent years. Yet it is a fact that the vast majority of the human race are under-nourished in varying degrees. Moreover the book shows that we must not exaggerate the increase in

¹ Oxford University Press, 1932.

production that has occurred since the war. With wheat for instance this increase has been very marked, and world production is now greater than it has ever been ; but output was steadily increasing before the war without creating any special problems of over-supply, and it suffered an immense decline between 1915 and 1917 ; the efforts of producers since the war have not yet sufficed to bring production up to the level which it would have reached if the pre-war rate of expansion had been continuously maintained.

This is only one of many points of great interest that the book makes clear. It covers a vast range of problems—mechanisation, wages and the improvement of agricultural technique ; it compares the present depression with those that have gone before. It examines the devices—tariffs, quotas, subsidies and the like—that are being used by various countries to save the farmer, drawing a necessary distinction between permanent and emergency policies ; and finally it discusses the measures undertaken by producers themselves, such as restriction and valorisation schemes and marketing reforms. The task accomplished is an immense one and it is better done than most people would have thought possible.

Among other books we have to welcome a new edition of *Fream's Elements of Agriculture*.¹ Published under the authority of this Society "Fream" has had a long career of usefulness, having already passed through eleven editions and sold to the number of some ninety thousand copies. The present (twelfth) edition is really a new book, prepared by the staff of the Cambridge School of Agriculture under the editorship of Sir Rowland Biffen, who took over the task on the death of Professor T. B. Wood. No less than eighteen persons have collaborated in its production, each of whom may fairly claim to speak with authority upon his particular branch.

There are, of course, two dangers inherent in this method of book production : on the one hand the result may lack unity, and on the other the specialist may be tempted to compress too much into his necessarily limited allotment of space. The latter danger is in fact less serious when, as in the present case, practically every contributor is an experienced teacher ; while the former has been avoided by the close collaboration of the authors and by the skill and industry of the Editor. Some of the illustrations are open to criticism, but it is confidently hoped that the work, in its new form, will re-establish its place as a standard text for the higher classes in Rural Schools, for Farm Institutes and for the elementary stages of instruction in Colleges and Universities.

Lord Bledisloe, whose keen interest in all farming matters is

¹ London : John Murray.

well known, manages to find time amidst his official duties as Governor General of New Zealand to maintain very close touch with the progress of agriculture. He has sent a copy of a sixty-page pamphlet, *A Conspectus of Agricultural Research*,¹ which consists of a reprint of his Cawthron Lecture, delivered at Nelson, New Zealand, in October last. In this he surveys the more striking achievements during recent years of scientific and economic research in relation to agriculture. It is impossible shortly to indicate the contents of the Lecture, for it covers practically the whole field, and practically the whole Empire. There will be few readers who fail to find some piece of new knowledge in it, and it is of special interest on account of the discussion of problems unfamiliar to us at home—the breeding of drought-resistant wheats in Australia, the mineral deficiencies of New Zealand soils, the storage of fruit during shipment, and the improvement of sugar cane. Considering the diversity of the subject matter the accuracy of the Paper is remarkable. Moreover it is eminently readable.

J.A.S.W.

The Waste Products of Agriculture,² by Howard and Wad, is a book of rather striking originality and more than ordinary interest. It deals mainly with the old problem of humus and organic manures. The maintenance of the humus supply in order to preserve the fertility of the soil has always been of greater importance to the agriculture of the more densely-populated East than it has been to the more prodigal farming of the West, where, on the other hand, technical processes of manufacture have provided the farmer with relatively cheap supplies of inorganic fertilisers. But, in spite of the teachings of the nineteenth-century agricultural chemists, the problem of the humus supply continues to attract growing attention both in America and in Great Britain. The view, once held, that all that was necessary to maintain the fertility of the soil was to supply it with the nitrogen and the minerals removed by each crop, is rapidly losing ground, and organic manures, from the point of view of their physical, chemical and biological effect on the soil, have again become important.

The Waste Products of Agriculture, although primarily concerned with the treatment of animal and plant residues in tropical and sub-tropical regions, raises some extremely interesting general problems with regard to the treatment and utilisation of organic fertilisers. In describing the process of "manufacture" of compost as conducted at the Institute of Plant Industry,

¹ Whitcombe & Tombs Ltd., 3-4 Addle Street, London, E.C.4. Price 1s.

² Oxford: Humphrey Milford.

Indore, the importance is stressed of maintaining aerobic conditions and high temperature right through the period of reduction of the waste material to humus. This is made possible by the constant turning of the compost heaps which are always kept small in size and height so that there shall be the minimum of pressure. The result of treating the material in this way is not merely to decrease the loss of nitrogen, but to increase the quantity over and above the amount contained in the plant tissues and animal residues—presumably by means of stimulated atmospheric fixation. The final product of the compost heap is a finely divided material which can be thoroughly incorporated with the soil particles.

From the point of view of the Indian cultivator the principles described are of the greatest value both in regard to increased soil fertility and to improved rural hygiene. But it may well be that the farmer of the West has still much to gain from the wealth of empirical knowledge of the farmers of the East, who have managed for many centuries to support a population more dense than those of England or Belgium, without the assistance of the ranches of Canada or Australia, and without the by-products of the coal gas or the steel industries. If our own farming is to become intensified it can only do this by maintaining the supply of organic matter to the soil, not by attempting to replace it with soluble salts, and, to quote:—

“The cultivators of the Orient were the first to grasp and act upon the master idea that the growth of a crop involves two separate processes, the preparation of food materials from vegetable and animal wastes which must be done outside the field, and the actual growing of the crop. Only in this way can the soil be protected from overwork.”

D.S.

THE SOUTHAMPTON SHOW, 1932.

THERE were many exceptional circumstances connected with the Southampton Show which must be considered in conjunction with the duty imposed upon the Council of the Society to hold the Shows or “Country Meetings,” as they are called in the Charter, throughout the length and breadth of England and Wales.

It must not be forgotten that Education in all branches of the Agricultural Industry is one of the foremost objects of the Society.

With the exception of the Reading Show of 1926 no Royal Show had been held in the South since the one at Maidstone in 1899, and Southampton itself had not received a visit from

the Society since 1844—a period of 88 years. Efforts had been made for some years to stage a Royal Show in the South or South-West of England. Members of the Council had been asked to suggest possible venues and sites, but no suitable area could be discovered offering a site level, approachable and adaptable.

When Southampton was first mentioned it was thought that "The Common" which had been utilised in previous years for the Shows of the Bath and West and Royal Counties Societies could be made available, but upon a sketch plan of a lay-out being prepared it was found that the acreage required and the period for which possession would be needed would so interfere with the rights of the ratepayers and those possessing public rights as to render the site impracticable. Eventually, through the good offices of Mr. T. W. Ashton, a site was secured at North Stoneham Park, some 3 miles from Southampton. This had been a well-known Remount Depot during the War and consequently did not require a great deal of levelling to convert it into a very compact Showyard. The owner of the land, Mr. J. A. Willis Fleming, and the tenant, Mr. G. H. Brown, met the Society most reasonably on the question of rent and charges for restoration of the land, etc.

It should here be explained that the Southampton Corporation found itself unable to enter into the usual Agreement with the Society for the provision of a site for a Showyard, levelling, laying on of gas, water and other public services, prize money, etc., and consequently the Society had itself directly to undertake these responsibilities. The Local Committees formed in Southampton, Hants, Dorset, Wilts. and West Sussex did, however, work energetically in collecting a Local Fund, and this after the deduction of expenses amounted to £5,215. It was handed over to the Society to meet the expenses of the Show, and the Chairman of the Finance Committee at the December meeting of the Council expressed the thanks of all concerned to those who had been responsible for the collection of this handsome donation which was such a great help in what was undoubtedly a difficult year.

All things considered, the Society may be considered fortunate in having carried through the Show with no greater loss, bearing in mind the difficulties of the times and the fact that in the past no Royal Show held south of the Metropolis has ever paid its way.

Southampton first received a visit from the Royal Agricultural Society in 1844 when the Show, the sixth of the series, took place under the presidency of the third Earl Spencer. On that occasion the classification comprised only eleven distinct breeds—two of horses, four of cattle, three of sheep

and two of pigs; the entries of live stock numbered in all 575; and the financial result was an adverse balance of £2,142.

The almost regular rectangular shape of the Stoneham Park ground lent itself to a most compact arrangement of the several sections and rendered easy the inspection of the exhibits by visitors—when they reached the Show. There were, however, some complaints by people coming from Southampton of the inadequacy of the transport service which, as one agricultural paper put it, necessitated long waits or long walks.

There was, as before stated, no contribution from the Local Committee's fund to the 1932 prize list, as on former occasions, so that the total sum of £14,299 offered for competition at Southampton was not so great as in recent years. The several Breed Societies, however, were again generous in their support, providing in all a sum of £3,313.

New features in the schedule were Jumping Competitions for Children's Ponies, and classes for New Forest Ponies.

A detailed statement of Prizes, Classes and Entries appears on page 271, and a table is given showing the entries at the 1932 Show, with comparative figures for eight preceding Shows.

The entries at Southampton, both of Stock and Implements, showed a considerable falling off. Though doubtless due in a large degree to the difficult times and prevailing depression, this was also partly accounted for by the fact that the Show venue was so far south and not entirely popular with exhibitors.

STATEMENT OF ENTRIES FOR THE 1932 SHOW, COMPARED WITH PREVIOUS YEARS.

Entries of Live Stock, Poultry and Produce.

	South- ampton, 1932.	Warwick, 1931.	Man- chester, 1930.	Harro- gate, 1929.	Notting- ham, 1928.	Newport, 1927.	Reading, 1926.	Chester, 1925.	Leicester, 1924.
Horses .	437 ¹	568 ¹	512 ¹	634 ¹	607 ¹	429 ¹	614 ¹	653 ¹	708 ¹
Cattle .	1,009 ¹	1,168 ¹	1,164 ¹	1,263 ¹	1,261 ¹	1,214 ¹	1,840 ¹	1,585 ¹	1,302 ¹
Goats .	75 ¹	68 ¹	48 ¹	92 ¹	61 ¹	40 ¹	67 ¹	56 ¹	68 ¹
Sheep .	520	569	735	723	591	524	724	711	693
Pigs .	551	688	678	691	833	664	986	938	1,212
Total .	2,592	3,061	3,137	3,408	3,353	2,971	4,981	3,922	3,973
Poultry .	840	741	901	943	1,036	897	1,111	970	1,137
Produce .	274	253	506	363	365	359	355	612	996

¹ Exclusive of Double Entries.

STATEMENT OF ENTRIES FOR THE 1932 SHOW, COMPARED WITH PREVIOUS YEARS—*continued.**Shedding in Implement Yard (in Feet).*

Description of shedding.	Southampton, 1932.	Warwick, 1931.	Manchester, 1930.	Harrogate, 1929.	Nottingham, 1928.	Newport, 1927.	Reading, 1926.	Chester, 1925.	Leicester, 1924.
	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.	Feet.
Ordinary .	1,845	2,190	2,690	2,995	3,035	2,875	3,360	3,985	4,145
Machinery .	2,630	3,690	4,515	4,170	5,466	3,855	4,090	3,380	3,685
Special .	2,450	3,088	3,488	3,686	3,501	2,756	3,420	3,575	3,867
(Seeds, Fertilisers, etc.)									
Total .	6,925	8,968	10,693	10,851	12,002	9,486	10,870	10,940	11,697
(Exclusive of Open Ground Space)									
No. of Stands	311	338	443	431	467	369	446	438	455

Sections cancelled under the prize-sheet regulation owing to insufficient entries were Welsh ponies, Welsh cattle, Belted Galloway and Galloway cattle, Dorset Horn, Leicester, Border Leicester, Welsh Mountain and Black Welsh Mountain sheep, and Tamworth pigs.

A Report on the Live Stock by Professor J. A. S. Watson is given in later pages of the present volume.

The spell of fine weather immediately preceding the Show broke down on the morning of the opening day, Tuesday, July 5th. Rain began to fall as the gates were opened and during the earlier part of the day the downpour was heavy.

Following the time-honoured custom, the first day was devoted to the judging of the live stock. In the Dairy Short-horn and British Friesian cattle, Large White, Middle White, and Large Black pig sections the judges commenced their duties at nine o'clock, but judging in the other classes of cattle and pigs, goats and sheep did not begin until 10 a.m.

Throughout the second day, Wednesday, July 6th, the weather was fine and warm with bright sunshine. The chief event was the official visit of the Duke and Duchess of York. Accompanied by Rear-Admiral Basil Brooke and Lady Helen Graham, Their Royal Highnesses arrived at the "West" station at 11.34. The new civic centre was inspected by them on their way to the Show, at the gates of which they were met by the Honorary Director, Mr. Roland Burke, who conducted them to the Royal Pavilion, where the President, Lord Mildmay, and members of the Council received them.

Shortly after their arrival Their Royal Highnesses paid a visit to the Flower Show.

STATEMENT OF ENTRIES, &c., AT SHOW HELD AT SOUTHAMPTON IN 1932.

HORSES, CATTLE AND GOATS.	1932.		SHEEP, PIGS, POULTRY AND PRODUCE.	1932.	
	Classes.	Entries.		Classes.	Entries.
HORSES :—			SHEEP :—		
Prizes		23,040	Prizes		22,014
Shire	10	61	Oxford Down	5	48
Clydesdale	5	39	Shropshire	6	30
Suffolk	12	76	Southdown	7	114
Percheron	8	40	Hampshire Down	5	53
Hunter—			Suffolk	6	59
Breeding Classes	10	56	Dorset Down	3	25
Riding Classes	5	65	Dorset Horn	3	—
Polo and Riding Pony—			Wiltshire or Western		
Breeding Classes	5	25	Horn	3	13
Hack	2	20	Ryeland	5	27
Welsh Pony	2	—	Kerry Hill (Wales)	5	28
Children's Pony	3	29	Clun Forest	2	10
Driving Classes	8	53	Lincoln	5	36
New Forest Pony	6	27	Leicester	4	—
Jumping	8	190	Border Leicester	4	—
Total for HORSES	84	636 ¹	Wensleydale	5	25
CATTLE :—			Kent or Romney Marsh		
Prizes		26,293	Devon Closewool	2	8
Shorthorn	11	68	South Devon	3	16
Hereford	9	51	Dartmoor	2	9
Devon	5	29	Welsh Mountain	2	—
Sussex	5	23	Black Welsh Mountain		
Welsh	5	—	Total for SHEEP	85	520
Longhorn	4	18			
Aberdeen-Angus	6	59	PIGS :—		
Belted Galloway	4	—	Prizes		21,593
Galloway	4	—	Large White	8	152
Dairy Shorthorn	10	145	Middle White	8	114
Lincolnshire Red			Tamworth	6	—
Shorthorn	7	30	Berkshire	8	59
South Devon	4	21	Wessex Saddleback	6	47
Red Poll	8	86	Large Black	8	92
Blue Albion	6	31	Gloucestershire		
British Friesian	13	113	Spots	6	25
Ayrshire	6	63	Essex	6	26
Guernsey	7	122	Long White Lop-		
Jersey	7	94	Eared	6	36
Kerry	4	21	Total for PIGS	62	551
Dexter	4	30			
Milk Yield	11	109	POULTRY :—		
Butter Test	2	61	Prizes		2401
Total for CATTLE	142	1,179 ¹	Entries	119	840
GOATS :—					
Prizes		2110	PRODUCE :—		
Inspection Classes	9	75	Prizes		2424
Milk Yield	2	59	Butter	5	32
Total for GOATS	11	134 ²	Cheese	15	154
			Cider	4	47
			Wool	17	51
			Total for PRODUCE	41	274

Grand Totals for LIVESTOCK, POULTRY, PRODUCE, &c., in 1932 } 544 Classes . 4,184 Entries . 214,235 Prizes

¹ Classes cancelled under regulation of Prize Sheet.

² Animals exhibited in more than one class are here counted as separate entries.

³ Including 2250 for Flower Show and 275 for Butter-making Competitions.

Returning to the Pavilion, the Duke and Duchess honoured the President and Council with their presence at luncheon.

In the afternoon from the Royal Box in the Grand Stand they witnessed various events in the large ring, including a parade of Champion Cattle and a Jumping Competition for Children's Ponies. Later, the Royal visitors made a tour of the Showground under the guidance of the President and Honorary Director. Calls were made at a number of stands, including those of the firms who had been awarded the Society's Medals for new implements, and that of the Southampton Corporation Electricity Undertaking.

At 4.30 p.m. Their Royal Highnesses left the Show and proceeded to Swaythling station, where they joined the 4.41 train to Waterloo, which was specially stopped here for their convenience.

A letter in the following terms was subsequently received by Lord Mildmay :—

7th July, 1932.

DEAR LORD MILDMAI,

Their Royal Highnesses the Duke and Duchess of York desire me to write and thank you for your letter, which I showed them this morning. They were delighted to hear that their presence helped the Royal Show during your year of office as President.

Their Royal Highnesses ask me to convey to you, and through you, to Mr. Roland Burke and all others principally concerned, their gratitude for all that was done to make their visit so enjoyable and comfortable. The organisation was evidently carefully thought out and so spared the Duchess any undue fatigue, and enabled Their Royal Highnesses, in the somewhat short time at their disposal, to see a fair number of the very interesting exhibits.

The Duke and Duchess both hope that there will be a good attendance on the remaining days of the Show, and that, when it closes, you, as President, will consider it has been a success in every way.

Yours sincerely,

B. V. BROOKE,
Comptroller.

On the morning of Wednesday the General Meeting of Governors and Members took place in the large tent. The President, in opening the proceedings, reviewed the circumstances in which the Show had come to Southampton and the difficulties which had had to be surmounted. The good work of the Local Committees in Hampshire, Wiltshire, Dorset and West Sussex was suitably acknowledged and a resolution of thanks was unanimously passed. To the usual expression of thanks to the railway companies for the assistance rendered by them, an amendment was moved and seconded to the effect that the resolution lie on the table. This, on being put to the meeting, found only eight supporters, and the vote of thanks to the companies was accorded by a large majority.

An event on Wednesday which was a source of much interest was the eleventh international cattle judging competition for the *Daily Mail* Gold Cup, organised by the National Federation of Young Farmers' Clubs. The cup-holders were the team from the United States of America, who again sent their champions (Oklahoma) to meet teams representing England and Northern Ireland. For the first time in the history of the competition as many as eight rings of cows and heifers—4 animals in each ring—were put up for judging. The breeds represented were Dairy Shorthorn, British Friesian, Ayrshire, Jersey and Guernsey. An innovation much appreciated by spectators was the installation of a microphone with loud-speakers to enable all to hear the reasons given by competitors for their placings. The Gold Cup was won by the English team. At the conclusion of the competition, the presentation of the awards and certificates was made by Lord Mildmay in the large ring.

On Thursday, July 7th, the weather was again showery, but, with the reduced admission charge of 3s., the attendance showed some improvement on the preceding two days.

Friday, July 8th, saw a return to warm, sunny weather. An additional attraction on this day was an Open Dog Show in the showyard arranged by the Hampshire Kennel Association. Nearly three thousand people visited this side-show, the competing entries in which reached a total of 577.

A special item of interest on the closing day, July 9th, was the exhibition of New Forest Ponies. Weather conditions were again good, and the attendance was the largest of the five days, including some hundreds of children in organised parties arranged through the local education authorities.

Particulars of the daily attendances at Southampton Show with comparative figures for earlier Shows will be found in the following table:

Admissions by Payment at Southampton, 1932.

Day of Show.	11 a.m.	1 p.m.	3 p.m.	5 p.m.	Day's total.
Tuesday (10s.)	440	851	1,050	1,111	1,115
Wednesday (5s.), after 2 p.m. (3s.)	1,325	3,666	6,645	7,963	8,165
Thursday (3s.)	2,949	7,364	10,265	11,411	11,686
Friday (2s. 6d.)	2,911	7,030	10,023	11,627	11,997
Saturday (1s.)	3,397	6,903	11,220	14,264	14,614
Total for Show					47,537

Total Daily Admissions at the 1932 Show, compared with the previous seven Shows.

Day of Show.	Southampton, 1932.	Warwick, 1931.	Manchester, 1930.	Harrogate, 1929.	Nottingham, 1928.	Newport, 1927.	Reading, 1926.	Chester, 1925.
First .	1,116	1,887	2,483	3,884	2,388	1,214	3,568	3,352
Second .	8,165	11,273	14,352	23,598	18,244	7,515	13,777	27,215
Third .	11,686	24,198	31,115	51,252	44,293	19,456	19,869	43,981
Fourth .	11,997	15,193	14,943	18,924	14,775	10,528	11,902	20,682
Fifth .	14,614	19,708	38,025	26,859	28,977	23,654	24,744	17,650
	47,578	72,259	100,918	124,017	108,677	62,367	73,860	112,880

As on former occasions, an excellent Horticultural Section was staged, and this again proved the most interesting and attractive side-show in the whole exhibition.

In their special pavilion the Ministry of Agriculture and Fisheries had a number of separate stands illustrating the grading and packing of various commodities to National Mark standards, and there were demonstrations dealing with the organisation of marketing of wool and potatoes. The need for greater uniformity in the quality of home-produced butter was illustrated, and a suggested method was shown for the application of the National Mark.

During the Show daily demonstrations with Bees were given in the Hives and Honey Section organised by the British Bee-keepers' Association; competitions in the shoeing of horses were carried out by the National Master Farriers' and Blacksmiths' Association; and lectures on veterinary subjects were given in the Members' Tent.

A special Ring attraction was provided by a Detachment of the Royal Scots Greys in the form of Military Rides and Trick Riding displays.

The Band of the Royal Scots Greys rendered musical programmes in the bandstand at intervals on each day of the Show.

A new departure was introduced at Southampton for the special reception of Overseas and Foreign visitors. The Council Room at the end of the Royal Pavilion was opened as a Reception Office and Lord Cornwallis, Sir Archibald Weigall and Colonel Stanyforth were appointed Stewards of this department. Owing to the universal depression prevailing in 1932 few distinguished visitors attended the Show, but it is hoped to make this innovation more serviceable and progressive as conditions become more normal, and a larger number of Overseas visitors attend.

The Hants County Constabulary were employed to police the inside of the Showyard, a duty which has been undertaken for many years past by the Metropolitan Police. The County Police carried out their work most efficiently. A considerable saving in administration expenses resulted as a consequence of the engagement of the County Constabulary.

The Bournemouth Division of the Y.M.C.A. undertook the welfare work for herdsmen, shepherds, grooms, etc. Concerts, sports and the provision of light refreshments were arranged under the supervision of Mr. Reynolds, the Divisional Secretary, and were much appreciated by the men. This is a feature of the Show that grows in importance and service each year.

The Caterers introduced a Cafeteria at one of the refreshment pavilions, and it proved to be popular and apparently to supply a much-needed want; a quick lunch at a moderate cost can be obtained at this place. The innovation so far justified itself as to induce the caterers to arrange for the provision of more bars of this kind at the next Show.

The Royal Automobile Club again undertook the parking of cars in the official Car Parks. Difficulties of approach to the Showyard, owing to the roadway being only 18 feet wide, were overcome by the capable handling of the car traffic by the R.A.C. Superintendent and his patrols.

The Southern Railway Company's arrangements for dealing with the Machinery and Live Stock traffic were as nearly ideal as possible. The Show site was situate midway between the Eastleigh and St. Denys stations. It was therefore decided to unload Machinery and Implements at St. Denys, and Live Stock at a special dock constructed at Eastleigh.

In view of the narrow roads to be traversed from the stations to the Showyard, this idea proved an admirable one, and the Southern Railway staff, under Mr. R. M. T. Richards, the Assistant Superintendent of the London West Division, are to be congratulated on the care and foresight displayed not only in the preparation of their plans but in the actual handling of the traffic.

T. B. TURNER

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London, W.O.

LIVE STOCK AT THE SOUTHAMPTON SHOW

WITH the whole agricultural industry still in the depths of depression and the economic position of the stockowner steadily becoming worse, it was scarcely to be hoped that the 1932 Meeting of the Society would prove anything like an outstanding success. Moreover, past experience of centres in the

extreme South was hardly calculated to inspire optimism. In the event, and despite weather that was on the whole very favourable, the attendance of the public was worse than the gloomiest predictions. On the other hand the live stock exhibit was better than most people had hoped ; indeed, judged by any other standard than that of a few recent "Royals" it was excellent. It is true that the number of entries was somewhat smaller than at any other post-war Show ; also that a rather larger number of breeds than usual failed to produce the minimum of entries required under the Society's rules, and hence had their classes cancelled. But the shortage of numbers was really noticeable only here and there, while the general level of merit has rarely been higher. In the vast majority of classes there were enough exhibits of real excellence to fill the prize lists and there was a striking absence throughout of anything like a "tail."

Naturally, those who attended the Meeting with the object of seeing the stock benefited from the absence of crowds. It was the first time in the experience of the writer that it has been possible to see the whole Royal Show in complete comfort and without fatigue. Another pleasing feature was the large number of continental visitors ; rarely has a larger variety of tongues been heard in the showground.

HORSES.

Draft horse breeding, although now upon a very much reduced scale, is again quite a flourishing industry, especially by comparison with some other sections of the livestock business. There can be no question that there is a definite and growing shortage of good draft animals, and there is no prospect of really adequate supplies for the coming three or four years. None of the four breeds was ill represented at Southampton, but the Suffolks made by much the most impressive display.

Two or three of the Shire classes were regrettably small, especially the three-year-old stallions and the yearling fillies. On the other hand, there was a first rate array of mares and a really magnificent class of geldings, every one of the seven exhibits being a great horse, massive, supple and full of quality. Clydesdales numbered only twenty-five all told, but this constituted an improvement on the Warwick Meeting. The best class was that for two-year-old colts, which brought together all the choicest specimens of that age. There were also four very beautiful mares, three of which were the progeny of one stallion. This breed seems fated, for good or ill, to be almost always dominated by a single outstanding sire. Thus

the late ruling monarch, "Dunure Footprint," appeared as grandsire of a very large number of the Southampton exhibits, while his successor "Benefactor" was the sire of both champions and of one of the reserves. Since most of the recent leading sires have been somewhat closely related, it almost inevitably follows that the best-bred Clydesdales are becoming rather closely inbred; for instance, the Champion mare had "Dunure Footprint" as a grandsire, a great-grandsire, and a great-great-grandsire. There can be no doubt about the superb quality of the Clydesdales that are now being shown, but it must seem to the outside observer that weight and real cart-horse character are tending to suffer neglect.

The Suffolks not only outnumbered any of the other breeds, but produced, in nearly every class, a remarkably high and uniform level of merit—so much so that the judge was set a succession of really troublesome problems. The modern Suffolk is up to any reasonable requirement in the matter of size, while the bone and feet, once a common matter for criticism, now leave little to be desired. One cannot help thinking that, in this last matter of feet, Suffolk and Percheron breeders have set themselves a more sensible ideal than the Shire and Clydesdale men. The latter seem to be bent on the kind of foot that will carry the largest possible size in shoe, with the result that in many cases there is a lack of thickness and substance; and, thinness apart, it must surely be true that a horse's foot can be too big as well as too small.

On the whole, Percherons perhaps scarcely maintained the standard of the previous Show at Warwick, but there were some excellent classes. That for two-year-old colts was noteworthy, and provided a really worthy and typical champion. This colt showed quite remarkable strength of loin, fine quarters, great bone and beautiful movement. The four massive grey geldings were also an excellent advertisement of the breed's merits.

Entries of Hunters, Hacks and Polo Ponies showed a very heavy fall from the previous year, numbers being down by nearly half. There were, of course, several obvious reasons for this, such as the distance of Southampton from the hunting shires and what has been described as the poverty of the wealthy class. There were, however, some very strong classes, notably the hunter brood mares. It is a rare thing to see at the Royal any animal of foreign origin and it was probably a unique event to see two such competing for leading honours in the same class. This occurred in the Polo Pony stallions, where a Belgian-bred pony led one of Argentine origin. Both were of remarkable quality and beauty. On the Saturday of the Meeting, there was an interesting display of the local New

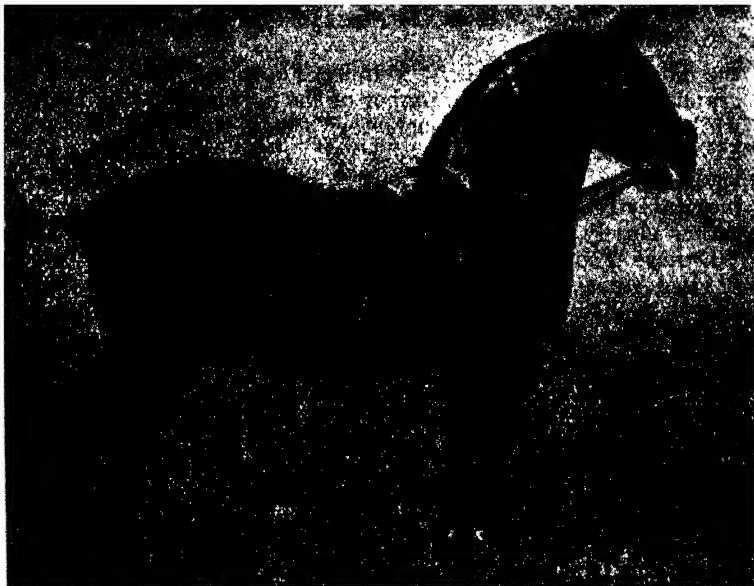


FIG. 1.—SUFFOLK STALLION, "RED GOLD OF WRATTING."
Winner of Champion Prize for best Suffolk Stallion, Southampton, 1932.
Exhibited by MR. FRANK SAINSBURY.



FIG. 2.—SUFFOLK MARE, "BAWDSEY SEEDLING."
Winner of Champion Prize for best Suffolk Mare or Filly, Southampton, 1932.
Exhibited by SIR CUTHBERT QUINER, BART.

Forest ponies. This breed is holding its own better than most of our old local ponies, largely because of its merits as a mount. Other breeds which have depended chiefly upon the demand for pit ponies seem to be fated to suffer virtual extinction, for a very few years will see all our mines equipped with electric haulage.

CATTLE.

The Shorthorn section was numerically small, only the classes for young bulls producing satisfactory competition. The breed's export trade is practically non-existent at the moment, and there is little hope of a revival of the old markets in the United States and Argentina. However, if Australia is to make a real bid for a share of the chilled meat trade, as seems very likely, a demand will doubtless arise in that quarter.

A curious and somewhat unfortunate incident occurred in connection with the award of the supreme championship of the Shorthorn Section (the "Brothers Colling" memorial cup). The two Judges disagreed as between the champion male and the champion female and the third Judge had to be called in to make the award. Meanwhile, however, the two animals which had stood reserve for the male and female championships respectively were left standing in the ring, and the umpire proceeded to examine and consider all four. Eventually, despite a protest from the judge of males, he reversed the latter's decision and awarded the supreme championship to the reserve champion male, the cow being given the reserve card. In fact all three animals concerned belonged to the same owner so that there was no occasion for an exhibitor's protest. The Shorthorn Society, however, at its meeting on the following day passed a resolution requesting the Royal Society so to alter its Rules as to prevent a similar occurrence in future. It may be recalled that an analogous case arose at Smithfield a few years ago and that an alteration of Rules was made which effectively prevents the reversal of one Judge's decision by another.

Herefords produced a larger entry than at Warwick and quality was very satisfactory. It was cheering too to observe quite a sprinkling of new names among the exhibitors. Devons were perhaps a little below average, but there were some splendid individual specimens, especially in the older classes. The champion bull, now seven years old, could well have been described as an outstanding animal, except that the second prize winner in the class was but little his inferior. Somers were a good average show, but rather better numbers might have been expected at a Meeting so near to the breed's home county. The remarkable cow *Lock Knoll* 2nd, now in her

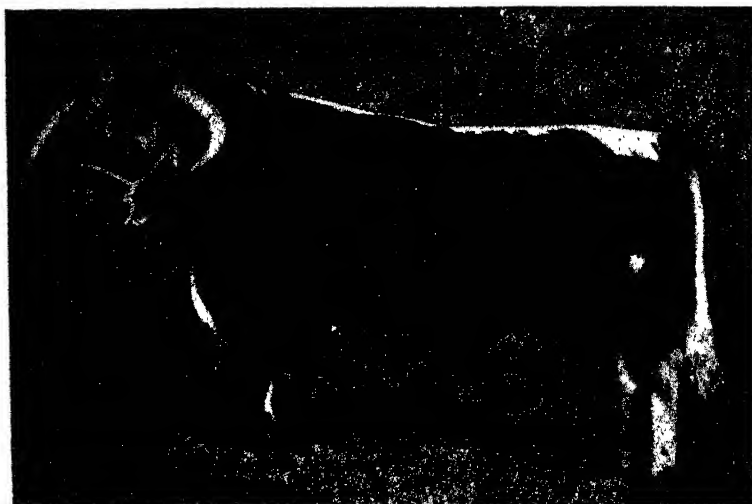


FIG. 3.—LONGHORN BULL, "SUTTON VICTOR."
Winner of Champion Prize for best Senior Longhorn, Southampton, 1932.
Exhibited by MR. R. S. WALTERS.



FIG. 4.—LONGHORN HEIFER, "FRIAR PET."
Winner of Champion Prize for best Junior Longhorn, Southampton, 1932.
Exhibited by MR. F. J. MAYO.

seventh year, created something of a record by winning her fourth successive Royal Championship. The Welsh, Galloway and Belted Galloway breeds were among the absentees, but there was quite a representative collection of Longhorns.

One of the most gratifying features in the Cattle section was the magnificent collection of Aberdeen-Angus, all the more creditable because the Meeting was situated nearly five hundred miles from the chief centre of the breed. It is true that the actual number of cattle paraded in the section only exceeded the beef Shorthorns by two; but in the one case there were six well filled classes with the keenest possible fight in every one, while in the Shorthorn section there were several among the ten classes which produced very little competition. Of the forty-nine entries which were forward only seven came from north of the Border.

The Dairy Shorthorn, with 145 entries, was again the most numerously represented breed of cattle. One or two of the female classes were hardly up to the usual Royal standard, but the bulls, taken throughout, were remarkably strong, representing a considerable improvement on the Warwick Meeting. There were no less than twenty-seven entries for the D.S.A. special prize for bulls of full milking pedigree, as against sixteen at Warwick in the previous year. This special class is very useful as emphasising the importance of a sustained policy in breeding. The greatest need in the Dairy Shorthorn is to "fix" more completely the deep milking qualities which characterise the bulk of the breed, but which still occasionally miss the individual animal in a disconcerting way.

Among the local breeds, the Lincoln Red and the South Devon were quite well represented. It is pleasing to record the return of the last named breed (and with one or two new and important patrons) after its two years' absence from the Royal. Red Polls, though somewhat short of last year's very large numbers, made an excellent display. In particular such classes of old cows and bulls as paraded at Southampton have probably never been seen before. His Majesty's Sandringham herd had the remarkable distinction of winning all three of the classes for heifers. There were one or two Blue Albions scarcely up to Royal quality, but on the whole the breed put up an improved show as compared with the Warwick Meeting.

Friesians paraded fully a hundred strong, but even so they dropped from second to third place in order of numbers, being excelled in this respect by the Guernseys. The black and white breed, however, made a most impressive display of real commercial dairy qualities, with none of the rather coarse and ungainly types of the early days of the breed. The Downshire

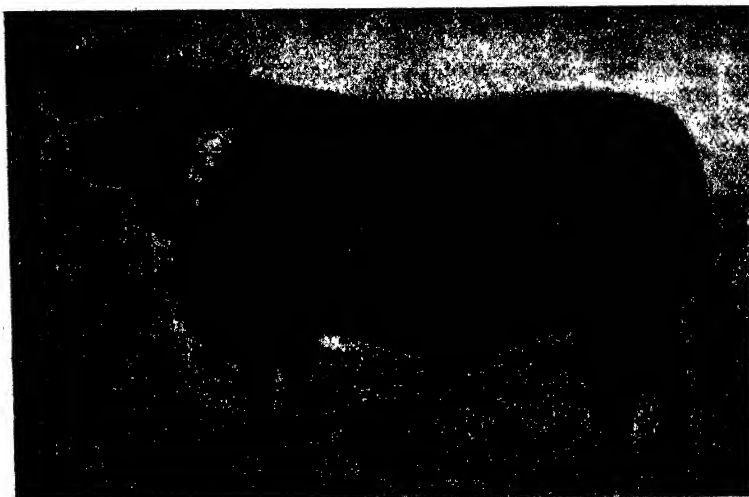


FIG. 5.—ABERDEEN-ANGUS BULL, "JARVIE ERIC."

Winner of Challenge Trophy for best Aberdeen-Angus Bull, and Champion Gold Medal for best Aberdeen-Angus Animal, Southampton, 1932.
Exhibited by MR. ANDREW T. REID.

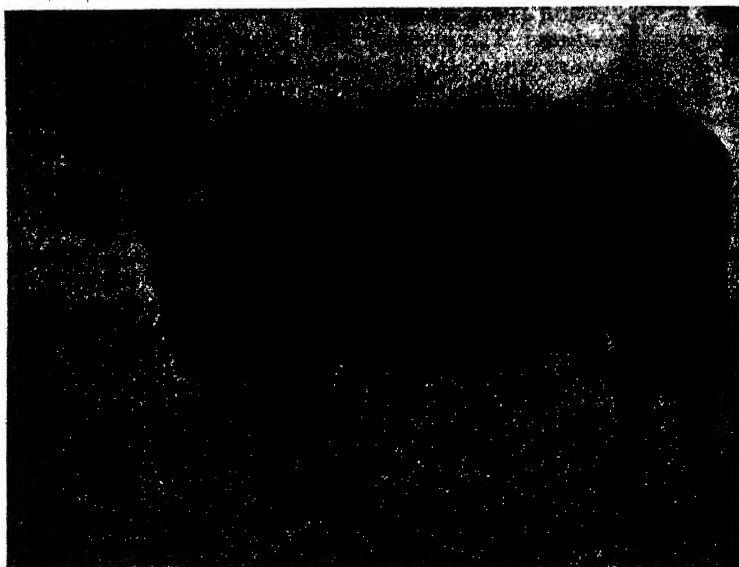


FIG. 6.—ABERDEEN-ANGUS COW, "ELLEN 3RD OF BASILDON."

Winner of Gold Medal for best Aberdeen-Angus Cow or Heifer, Southampton, 1932.
Exhibited by COL. J. F. M. BAKENDALE, C.B.

herd had a run of successes in the heifer classes comparable to that of His Majesty's Red Polls, scoring first in three of the four classes and second in the remaining one. With eleven animals shown this herd won £119 in prize money in addition to two trophies. Living up to its reputation as a milker the Friesian produced the two highest yields in the milking trials, an Ayrshire coming third and being closely followed in order by a Dairy Shorthorn and a Lincoln Red. A Friesian also headed the butter tests.

Recent years have seen a rapid increase in the Ayrshire section of the Royal, and this year marked a further big advance, both in numbers and in quality. A classification of the entries showed the extent to which the breed is spreading, and indicated one of the causes of the phenomenon; two thirds of the entries were from England, and one third of the total were from Licensed (Tuberculin tested) herds.

Those visitors who went to Southampton in the hope of seeing a really fine collection of Guernseys were not disappointed. The entry nearly doubled that at Warwick, and quality in no way suffered by comparison. "The best lot of Guernseys since Reading" (1926) was the general verdict. Jerseys also, though a trifle down in numbers, were good. In the Kerrys the class of cows was highly creditable, and the breed was further distinguished by producing by much the oldest individual animal in the cattle section. This bull, which was breed champion at Warwick last year and which was still good enough to win his class at Southampton, was in his fourteenth year. He is said to have sired 85 calves in 1929 and 83 in 1930, and is still breeding. The Dexter classes were well filled and contained a number of very attractive little cattle.

SHEEP.

Sheep breeders met under depressing circumstances, for it was obvious by the date of the Meeting that the bottom had fallen out of the mutton market and that returns from wool were to be the lowest within memory. These conditions, it was felt, were bound to react disastrously upon the autumn sales of breeding sheep. It need not be added that the gloomiest predictions were more than fulfilled.

Nevertheless the show of sheep was an excellent one. The fall in the number of entries from the previous year was trifling. On the one hand none of the Mountain breeds was represented, but this deficiency was almost balanced by a remarkably large and fine display of Downs. The only serious disappointment was occasioned by the absence of the Dorset Horn. This old breed has of late been attracting fresh interest



FIG. 7.—DORSET DOWN RAM LAMB.

*Winner of Champion Prize for best Exhibit of Dorset Down Sheep, Southampton, 1932.
Exhibited by MESSRS. P. & C. SEWARD.*

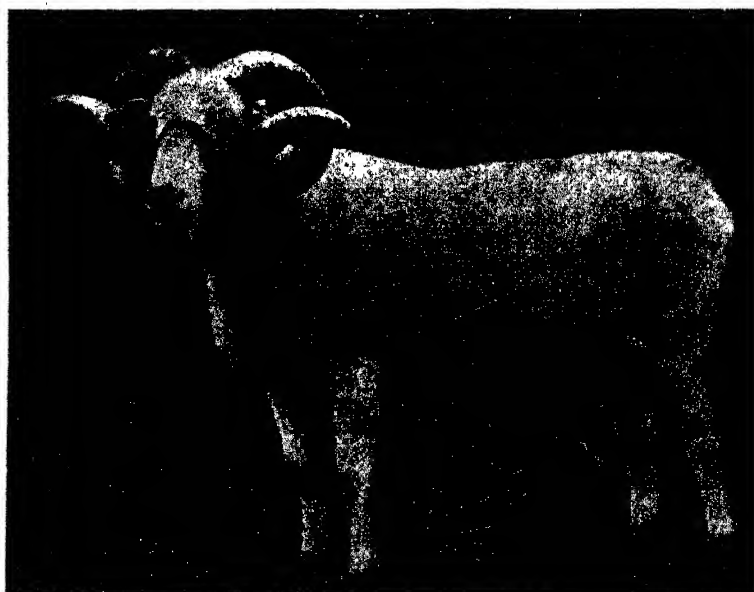


FIG. 8.—WILTSHIRE OR WESTERN HORN RAM.

*Winner of Champion Prize for best Exhibit of Wiltshire or Western Horn Sheep,
Southampton, 1932.
Exhibited by MR. C. E. GILEY.*

in view of the possibilities of the trade in out-of-season lamb and, with the Meeting very conveniently situated for the home breeding grounds, many visitors looked forward to seeing a large and representative collection of the breed. In short, an excellent opportunity for useful publicity was completely missed.

All the six Down breeds, with the exception of the Shropshire, produced increased numbers. The Southdowns with 114 pens and well over 200 individual sheep gave the judge an extremely arduous day. The lamb classes alone were worth going a hundred miles to see. Dorset Downs, after being unrepresented last year, produced three well-filled classes of beautiful sheep.

There was fair competition in the three classes provided for Wiltshire or Western Horn sheep. It is still a little difficult perhaps to get accustomed to the idea of a sheep without wool; yet Professor White has recently suggested that the British sheep farmer might do well to forget that wool has any commercial value at all, and to regard the fleece merely as a protective covering for the sheep's skin. Certain it is that a pound of clean wool costs far more nutrients to produce than a pound of mutton and that at present it is usually worth less money. It is indeed tragic to think of the centuries of study and skill that have been devoted to the production of the wonderful fleeces of the Lincoln, Leicester or Wensleydale sheep, only to find that the final product is worth a fraction of a penny more than the coarsest of carpet wool, and much less than the price of cotton.

Ryelands were a larger show than at Warwick, and included some very perfect specimens. It was good news to hear of the formation of a new Ryeland Breed Society in Australia and to learn of enquiries from Australia and elsewhere about sheep for export. In the wool section the Ryeland secured the championship for short wool fleeces ("The Merchants of the Staple of England" Prize), with the Dorset Down reserve. This indeed is not unprecedented, but the Southdown has usually been hard to beat.

Kerry Hill and Clun Forest sheep were, as might have been expected, rather down in numbers, but there was still keen competition in most of the classes. There were only five exhibitors of Lincolns, but between them they sent over two score of sheep, and the prize money was well scattered. Among the Wensleydales the most interesting class was that for yearling ewes shown in wool. There is nothing else in the sheep world like the Wensleydale fleece with its remarkable combination of length, fineness and silky lustre. The fleece of the leading ewe measured about 14 inches in length. The "Merchants of the

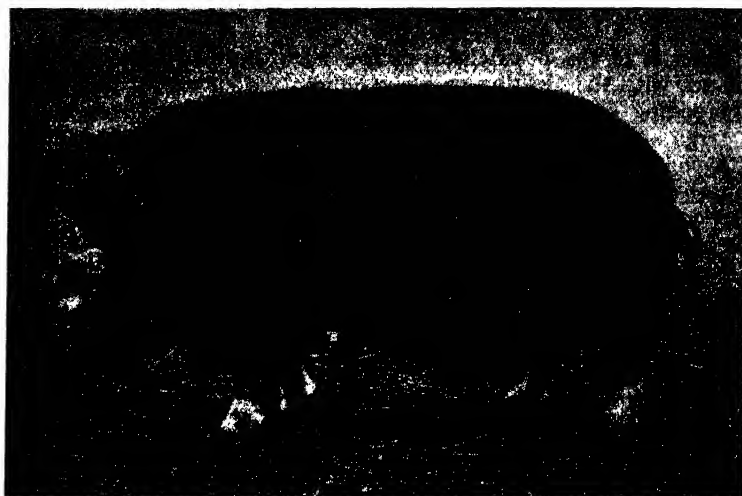


FIG. 9.—BERKSHIRE BOAR, "HIGHFIELD ROY PRESIDENT 8TH."
Winner of Champion Prize for best Berkshire Boar, Southampton, 1932.
Exhibited by MR. FRANK TOWNEND.

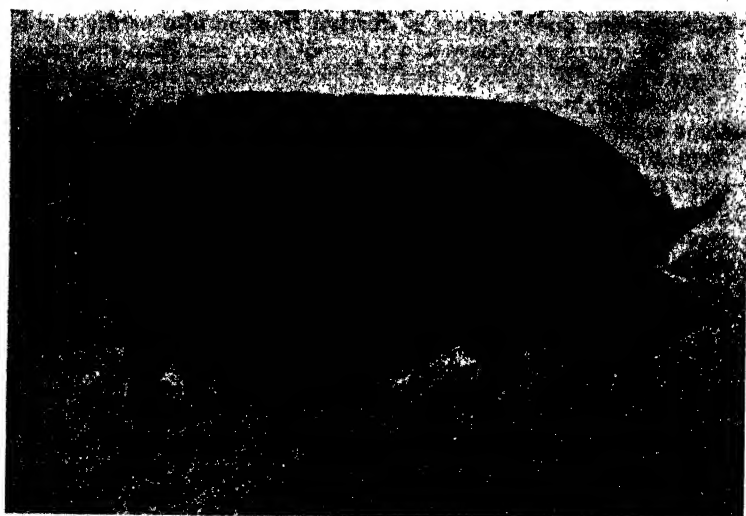


FIG. 10.—BERKSHIRE BREEDING SOW, "HILLFOOT MISS 2ND."
Winner of Champion Prize for best Berkshire Sow, and Cup for best Berkshire Pig,
Southampton, 1932.
Exhibited by MR. H. C. INWOOD.

Staple" Championship prize for Long Wool was won by the Wensleydale, with the Lincoln reserve.

In the post-war period the Kent or Romney Marsh breed has very often provided the largest display in the sheep section, but with the export trade almost at a standstill breeders are rather under the weather. There is little money to spend on showing, and not much chance of any direct financial return. There was, in fact, a large class of shearling rams, containing several sheep of the very best character; but the lamb classes tailed off into a succession of duels between two of the leading flocks. There is little doubt that—even with New Zealand as a competitor instead of a buyer—English Romneys will again command good money, for the breed is indispensable to many sheep countries.

An interesting newcomer to the Royal was the Devon Closewool, produced by blending the blood of the Devon Longwool with that of the hardy little Exmoor Horn, and now apparently pretty well fixed as to type. The object has been of course to produce a hardy grassland breed that would be small enough and lean enough to suit the taste of the modern consumer. Two of the older breeds from the south-west, the Dartmoor and the South Devon, were forward in small numbers.

PIGS.

Eight breeds of pigs were represented, the Tamworth being the only absentee from among those shown at Warwick. The Large White section, though easily the largest, was not quite so unwieldy as it has been in recent years, and with two judges instead of one the placing was carried through with expedition. The judge of males was faced in his first class with the always awkward problem presented by a good animal that is shown very lame. There is no satisfactory answer to it. In this case the animal in question was placed first in his class and was later awarded the male championship; whereas another judge might with equal reason have sent the boar back to his sty. For a breed so large and so widely distributed as is the Large White, the uniformity of type was this year rather striking. There was almost a complete absence of the long-nosed and ultra-leggy pigs that not so long ago were fairly common.

Middle Whites were the second largest section with an average of some fourteen animals in each of the eight classes. The representation of the breed was good though not extraordinarily so.

Berkshires were a dozen or so short of last year's numbers, but it was the general opinion that quality has rarely been better. Wesssex were well up to their usual standard, while

Large Blacks showed a slight increase on the Warwick numbers. The Gloucester Old Spot classes were rather thin but every exhibit was creditable. Unlike the other quadruped of the proverb, the Gloucester has had no difficulty in "changing his spots" to meet the modern preference for the white pig. A comparison of the present-day pigs with typical photographs of ten years ago will show that the amount of black in the coat has been greatly reduced. Indeed a good many pigs at Southampton had only a few bluish spots on the skin and practically no black hair.

Only four herds of Essex pigs were represented, but the classes for the younger ages produced very fair competition. The Long White Lop Ear seems to be maintaining its popularity in its native South-West and produced three dozen entries from eight herds.

J. A. S. WATSON.

School of Rural Economy,
Oxford.

REPORT ON NEW IMPLEMENTS ENTERED AT THE SOUTHAMPTON SHOW, 1932.

In his report on the new implements entered at the Reading Show of 1926 the present writer suggested that in future machines entered for the Silver Medal should be available some time before the Show. The object of this suggestion was to provide the Judges with the opportunity of seeing the implements at work. Of course a detailed examination of a machine, at rest, enables a judgment to be formed on such questions as those of mechanical design and stability of construction; but a sound opinion on the broad question of practical utility can scarcely be reached without some kind of test or field trial. The task of the Judges has been made a much easier one since such tests were instituted. This year every implement submitted was seen, by one or other or both of the Judges, either under test or at work in the field.

In the report already alluded to the writer also suggested that machines entered for the Medal tend to fall into two categories: on the one hand are those that embody some new principle or achieve for the first time some definite practical object, and on the other hand those that are new only in the sense that they embody some new detail or improvement of a minor kind. This distinction has been kept in mind in connection with the present year's entries.

The Judges wish to take this opportunity of saying that

some of the entries which they felt unable to recommend for awards were nevertheless of considerable merit, and likely to prove useful. Moreover there were many implements on the stands at Southampton, apart from those entered for the Silver Medal, which bore evidence of the steady efforts of manufacturers to improve upon the already high standards of British Agricultural Engineering. Great credit is due to the industry for maintaining its enterprise and its fine traditions in these most difficult times.

I. Transplanting Machine marketed by Transplanters (Holding Company) Ltd., 41, Moorfields, London, E.C.2.

The writer saw this machine when it first reached this country some years ago, and has since followed its development with great interest. It was tested at the South-Eastern Agricultural College, Wye, in the end of 1931, and a report



FIG. 1.—Transplanting Machine.

has been issued by the College. It was also demonstrated by Mr. John Porter, Agricultural Organiser for Buckingham.

The machine, since its first importation, has been modified from time to time and, as placed before the Judges at Southampton, could almost be regarded as a new machine. It consists of a steel frame carried on two main wheels (one of which drives the mechanism) and two rear wheels which act as furrow presses. A V-shaped furrow opener in front makes the

small furrow in which the plants are eventually set. The frame carries two sets of trays mounted on endless bands which are driven through suitable gearing. The plants are placed in the trays by feeders who ride on the machine and for whom four seats are provided. Between the two sets of trays is an endless chain carrying a series of fingers, which grip the plants in turn, carry them under the front of the machine and release them, at the appropriate moment, in the furrow. Meanwhile the press wheels have consolidated the soil round the plant roots. A lever is provided for raising the furrow opener, while there is also a clutch to control the feed mechanism.

As some indication of the capacity of the machine we may quote from the Wye report that it was used to plant 12 acres of Spring Cabbage—at 18 inches apart in rows 30 inches apart—and that it worked successfully at the rate of over 8,000 plants per hour.

In connection with its entry for the Silver Medal the Transplanter was tried, under really difficult conditions, on a farm near Evesham. The quality of the work, in the opinion of the farmer, was superior to hand dibbling and this opinion was shared by three market gardeners who were present at the trial. The Judges considered that the Medal should be awarded in this case, especially as the machine definitely falls into the first of the categories indicated above.

II. New Patent Diesel Engine by Messrs. Bamfords, Uttoxeter.

This machine was seen under test at the trial ground of the Institute of Agricultural Engineering, Hampton Poyle, Oxford. The new features are the following:—

- (1) Special combustion head designed to give easy starting and clean exhaust and to eliminate as far as possible the usual "Diesel knock";
- (2) Patent Valve operating gear actuated by a single operating rod worked by an eccentric. In this design, cams and tappets are dispensed with and the valves can be removed without breaking the water joint or the cylinder head gasket joint;
- (3) A crank case that can be hinged over to exhibit all the working parts. This design has already been used by the firm in their petrol engines and renders adjustments and repairs easy and rapid.

The engine burns crude oil, which is much cheaper than petrol and also less dangerous on the farm, because its combustion point is higher. For this reason also the engine is simpler in construction than a petrol engine. The whole of the working

parts are enclosed in a dust-proof case. The engine starts easily, which is a point of great importance on the farm. The valves are disposed horizontally and can be removed without lifting the cylinder head or breaking of the water and

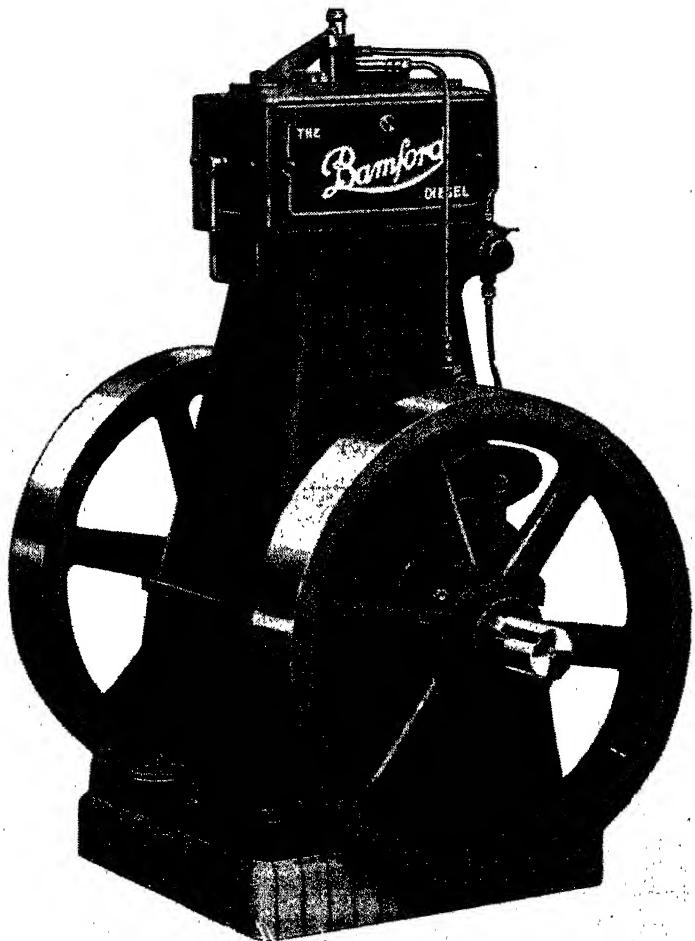


FIG. 2.—Bamfords Diesel Engine.

cylinder gasket joints, whilst the gear for operating the valves is of a design which permits the operation of both inlet and exhaust valves from a single operating rod actuated by an eccentric, cams being dispensed with and working parts reduced

by half. The feature of accessibility, characteristic of all the Bamford engines, is embodied in this model by the fitting of a patent hinge over the crank case. The upper half carries the main bearings, crank shaft, etc., and these are consequently all accessible when the top casing is hinged over. The piston can also be withdrawn, this being the first Diesel type of engine to embody this feature. During all the running of the engine there was practically complete absence of the usual Diesel knock, whilst the exhaust was clean throughout.

The fuel consumption was very moderate for a single cylinder engine of this size. At the current price the fuel cost in ordinary working would be about $1\frac{1}{2}d.$ per hour on full load and $\frac{3}{4}d.$ an hour on half load. The general construction of the engine is robust and the simplicity of arrangement of the working parts makes it eminently suitable for agricultural use. The Judges awarded a Silver Medal to this entry.

III. Renewable Tine Flexible Harrow by William Aitkenhead, Failsworth, Manchester.

The new feature embodied in this implement is the use of double-ended renewable tines. These are quite cheap and obviate the necessity for drawing out or repointing the tines, which so

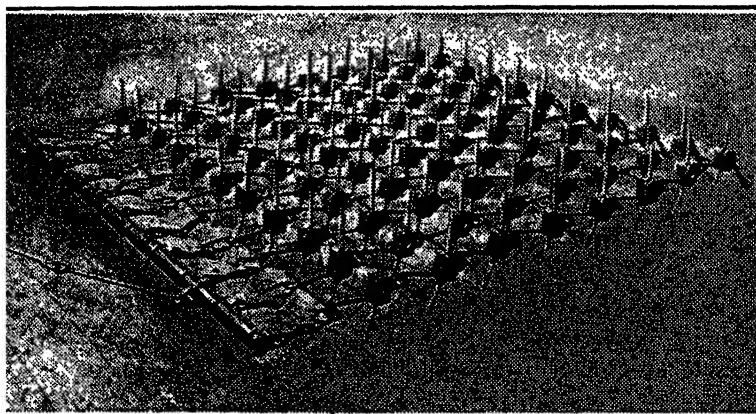


FIG. 3.—Renewable Tine Flexible Harrow.

often occurs with fixed tine harrows. When this is done by the local smith, changes take place in the composition of the surface metal of the tine and wearing quality is very markedly reduced. The flexibility of the harrows is greater than that of the ordinary jointed harrow. The advantage claimed for the construction is that the tine can be made of high-

grade steel and that since each tine can be removed separately it can be heat-treated separately from the links. There is no restriction as to the shape of tine that can be fitted, while broken or worn tines can be replaced, very readily and simply from a mechanical point of view, at the low cost of 4d. each.

The implement was seen at work near Oxford, where it had been used in the cultivation of some 200 acres of arable land under difficult conditions; it had carried out the preparation of a seed bed in one operation, which would probably not have been possible with any other type of harrow in less than two. The machine has also been used on grassland and did satisfactory work. In the Judges' opinion it shows a marked advance on the ordinary joint harrows, which have been popular for many years. A Silver Medal was accordingly awarded.

IV. Open-air Milking Plant by Gascoignes (Reading) Ltd.

The entry consists of a group of 6 milking stalls constructed of light wooden partitions and provided with a folding canvas roof. Three pulsators are fitted, one above each pair of stalls, together with a vacuum pipe and easily removable milk pipes. The remainder of the plant consists of three milking points (claw and teat cups), a direct coupled engine and pump mounted on wheels, a two-way device for milking into two churns simultaneously and finally two vacuum-sealed churn lids adapted to fit any standard churn. All the milking parts, with the exception of the easily removable milk pipes, the two-way milking device, and the churn lids, are precisely the same as those included in the Gascoigne Milking Machine, which was awarded a Silver Medal at Warwick in 1931. The new features consist, therefore, of these three exceptions, together with the adaptation of the whole for open-air use. The outfit was seen in operation on a farm near Yeovil. It was being used for milking a herd of about 45 cows, which, a few days previously, had been moved out into the open for the summer. No trouble was being experienced and milking was proceeding quickly and satisfactorily. The bail, since it is constructed of very light material, is readily portable by manual labour, and the design is well thought out. The light material of which it is constructed makes the bail easily repairable and the price is very attractive to the dairy farmer. When, however, those portions of the device, which received a Silver Medal last year, were excluded, the entry did not in the Judges' opinion embody enough new features to be worthy of the award of an additional medal.

V. Excelsior Cattle Drinking Bowl, by the Salopian Cattle Bowl Co., Whitchurch, Shropshire.

This bowl was entered in 1930, but was deferred by the Implement Committee until 1932 in order to enable suitable tests to be carried out. The original feature of the bowl is that no tongue or other device for opening the tap is necessary; a stop-valve is included in the bracket, which is connected to the water supply pipe and is normally kept closed by a spring. It is opened by downward pressure of the bowl. The system was installed for a practical working test in an ordinary cowshed near Oxford. The farmer was quite satisfied with the working of the installation, but in the opinion of the Judges, the bowl offers so little advantage over several other types on the market that it can hardly be regarded as falling within the category of machines for which a medal can be awarded. Many of the other bowls give results which are equally satisfactory. It may, however, be said that since its first design improvements have been made from time to time and it will no doubt find a ready sale amongst dairy farmers.

VI. Miller Non-Zlip Tractor Wheels, by Miller Wheels, Ltd., Chelsfield, Kent.

The wheels consist essentially of a solid disc on the periphery of which cross cleats, suitably notched, are fitted by means of angle brackets and bolts. The cleats are set at such an angle to the disc that they are at right angles to the ground when emerging. The disc has a suitable hub fitting for each particular tractor to which the wheels may be fitted. Various sizes of cleats may be fitted, e.g., 12 × 6 inches, 8 × 6 inches, 12 × 3½ inches, depending upon the nature of the work to be done. Road bands are provided. The whole design of the wheels is entirely new.

The claim is made by the manufacturer that this wheel has a great advantage over other straked wheels, and that trials which have been carried out indicate that this is particularly true when using the wheel for row crop work. One marked advantage is that it avoids the accumulation of dirt upon the cleats. The wheel was seen working at the trial ground of the Institute of Agricultural Engineering, where certain tests were carried out. Under the conditions prevailing, however, it was difficult to observe the advantages of the wheel over other types used on tractors, and the Judges therefore recommended that the entry be retained for further trial under field conditions next year.

VII. Kartof Spraying Machine, by Aktieselskabet Kartof, Copenhagen, Denmark.

This was tested in 1931, and a description of the machine and its working was given in last year's report. The Judges then considered that the general construction was not up to British standards, and they deferred consideration until this should be improved. The following points have since been altered:—

- (1) The hand levers operating the clutch and the outflow respectively have been provided with a locking device to give a positive action;
- (2) The ratchet and pawls of the road wheels are now of larger dimensions and of higher grade material.
- (3) The quantity indicator has been regraduated in gallons per acre.
- (4) One-horse shafts have been fitted.

These improvements cover most of the points to which adverse criticism was directed last year. In spite of these changes, there is still some room for improvement, and although the machine has done satisfactory work it has not, in the Judges' opinion, been sufficiently perfected to be of general value to practical farming in this country. There is, however, no doubt that the idea is very good, and that with further experience the machine will be perfected.

THOMPSON CLOSE..

10, Whitehall Place,
London, S.W.1.

REPORT OF THE STEWARD OF DAIRYING, SOUTHAMPTON SHOW, 1932.

MILK YIELD TRIALS.

CATTLE, CLASSES 203 TO 213.

THE trials at Southampton were on the same lines as in 1931; 109 entries had been made, but only 79 actually competed, an increase on the previous year's 64, but still well below many recent shows. Fifty of the cows were thrice milked, which is a smaller proportion than a year ago.

No Championship Prizes were given this year, but good performances were put up by the following animals, *viz.*, the Dairy Shorthorn "Aldenham Kirklevington Lady 3rd," with a yield of 79½ lb. of milk, the total points gained being 92.38. This cow was easily first for her breed.

In the Lincoln Red section, "Scothern Charm," giving 79 lb. of milk, gained first prize with 91.12 points.

There were two good cows in the South Devon classes, "Snowdrop 2nd" giving 69 lb. and being first with 94.97

TABLE I.—MILK YIELD CLASSES AT SOUTHAMPTON, 1932.

No. in Catalogue.	Exhibitor.	Name of Cow.	Live weight.	Date of birth.	Date of last calf.	No. of days in milk.	Date of last Service.	Milk Yield.				Points.			Awards and Remarks.
								Morning.	Noon.	Evening.	Total.	Average per cent. $\times 4$.	Leading.	Total.	
			Lb.		1932		1932	Lb. oz.	Lb. oz.	Lb. oz.	Lb. oz.				
Class 203		Dairy Shorthorn. Thrice Milked.													
763	Dobson and Torg	Anderson Wild Eyes 2nd	1421	April 24, 1925	June 18	19	—	24 0	19 12	24 12	68 8	9.13	NH	77.63	Fat below Standard First Prize.
767	J. Pierpont Morgan	Albanham Kirklevington Lady 3rd.	1470	June 15, 1927	June 4	33	—	23 8	24 12	26 4	79 8	13.83	NH	93.83	
768	J. Pierpont Morgan	Albion Wild Eyes 2nd	1463	Jan. 9, 1928	May 26	42	—	24 0	18 0	21 0	63 0	10.00	20	73.20	Fat below Standard
791	J. Washington Wardle	Lawnhead Moss Rose 20th	1190	Aug. 21, 1927	May 13	55	—	21 12	24 12	22 0	68 8	9.20	1.05	70.20	Fat below Standard
Class 203		Dairy Shorthorn. Twice Milked.													
776	J. B. Taylor	Phiney's Lillian	1190	April 10, 1926	June 17	20	—	23 12	—	26 0	53 12	11.00	NH	63.75	Fat below Standard
778	John Gowers	Thornby Peggathorpe 30th	1470	Sept. 20, 1927	May 1	67	—	19 8	—	24 4	43 12	13.40	3.70	83.55	Second Prize
778	Capt. Arnold & Wills	Thornby Peggathorpe 30th	1369	June 19, 1927	June 3	34	—	34 4	—	31 8	65 12	17.50	NH	83.65	
Class 204		Lincolnshire Red Shorthorn. Thrice Milked.													
839	John Evans & Son	Brookholme Recorder	1400	May 21, 1923	May 19	49	—	24 8	23 0	21 12	69 4	15.00	30	82.15	Third Prize
844	John Evans & Son	Burton Jewess 6th.	1540	Oct. 17, 1923	May 30	33	—	23 8	21 8	24 0	69 12	12.80	NH	84.32	Second Prize
846	John Evans & Son	Burton Ruby Sept. 2nd.	1379	Sept. 17, 1923	May 26	43	—	23 0	21 8	24 4	69 12	12.80	30	79.85	Reserve Number
848	Frank Sainsbury	Scandinavian 10th	1474	Aug. 14, 1923	May 26	40	—	23 12	23 4	24 0	70 12	12.13	NH	91.13	First Prize
850	Russell Wood	Scandinavian 10th	1442	May 16, 1923	June 10	27	—	24 8	15 8	19 4	62 4	13.23	NH	75.53	H.C.
Class 205		South Devon. Thrice Milked.													
871	Darlington Hall Ltd.	Darlington Hilda	1624	Nov. 28, 1927	June 3	34	—	26 4	21 0	21 12	69 0	15.20	NH	74.20	H.C.
873	Darlington Hall Ltd.	Darlington Welcome 2nd	1540	(6 years)	April 21	77	—	23 4	17 8	15 0	55 12	15.12	3.70	74.07	Second Prize
873	Darlington Hall Ltd.	Milkmald 3rd.	1423	Feb. 10, 1928	Mar. 12	117	May 29	23 12	18 8	22 0	64 0	12.40	NH	74.07	Reserve Number
874	Darlington Hall Ltd.	Myrie	1547	Jan. 28, 1928	April 26	73	—	23 8	18 0	23 8	69 12	13.40	3.20	83.95	First Prize
876	J. T. Dennis	Snowdrop 2nd	1392	Dec. 16, 1923	Mar. 19	113	June 7	20 8	17 12	15 8	60 0	17.72	7.00	84.47	First Prize
876	Miss Jervoise Smith	Didham Nina 2nd	1406	June 8, 1926	June 15	19	—	20 12	15 4	20 0	60 0	15.62	NH	84.62	Third Prize
Class 206		Red Poll. Thrice Milked.													
884	Lord Cranworth	Grantham Wandle	1431	July 4, 1927	April 30	43	—	24 0	16 4	20 12	61 0	13.60	3.40	77.40	First Prize
886	La-Ool. Sir. Merrick	Knepp Prudence 8th	1449	Aug. 6, 1927	May 25	43	—	18 4	15 12	20 12	54 12	11.08	3.80	69.73	Fat below Standard
983	Burrell, Bart., C.B.E.	Weston Bell	1106	Dec. 12, 1927	May 12	65	—	16 0	18 4	16 8	49 12	11.88	1.50	63.13	Fat below Standard
948	C. H. Cearn	Willoway Widgcon	1190	April 13, 1927	June 5	32	—	16 8	13 12	16 0	45 4	10.32	NH	74.07	Fat below Standard

Class 906	Mrs. M. L. Griffith.	Red Poll, Twine Milked.	1438	May 1, 1926	April 24	74	—	31	4	—	83	0	64	4	2-43	64-26	9-68	3-40	87-05	Fat below Standard
Class 907	Percy Dobson	Blue Arabian, Thrice Milked.	1092	June 21, 1926	June 17	20	—	29	8	23	0	94	8	76	0	2-65	70-00	10-80	80-60	Fat below Standard
Class 907	Charles H. Wobler	Ridgewayne Daisy 2nd.	1213	July 14, 1927	June 20	37	—	28	8	24	4	24	0	71	12	2-92	71-75	11-09	83-43	Fat below Standard
Class 907	T. H. Calderbank	Blow Glosly	1170	Dec. 8, 1925	May 16	22	—	37	12	—	33	0	70	12	3-72	70-75	10-88	1-20	82-83	Fat below Standard
Class 908	Henry Matthews.	Iris of Winterbourne	1431	Sept., 1926	June 11	26	—	20	12	—	22	4	49	0	2-97	40-40	11-88	80-88	80-88	Fat below Standard
Class 908	A. Barber.	British Friesian, Thrice Milked.	1930	Feb. 14, 1925	May 8	60	—	29	12	27	4	26	0	83	0	2-80	83-00	11-20	80-20	Fat below Standard
Class 908	J. G. Barton	Yankee Snowdrop	1606	April 16, 1923	May 8	19	—	34	0	27	12	39	8	62	8	3-63	92-60	14-82	107-02	Fat below Standard
Class 908	John E. Oatley	Cherrydale Hedge Rose 2nd	1046	Nov. 1, 1925	May 7	61	—	29	12	24	0	26	0	78	12	2-43	78-12	14-82	79-12	Fat below Standard
Class 908	Lord Rayleigh	Curlewage Flora	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
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Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
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Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-03	76-25	14-82	80-25	Fat below Standard
Class 908	Lord Rayleigh	Twining Tord 40th	1470	Sept. 22, 1924	May 4	44	—	23	6	16	0	83	4	68	0	3-0				

TABLE I.—MILK YIELD CLASSES AT SOUTHAMPTON, 1932 (continued).

No. in Catalogue.	Exhibitor.	Name of Cow.	Live-weight.	Date of birth.	Date of last calf.	No. of days in milk.	Date of last service.	Milk Yield.				Points.			Awards and Remarks.
								Morning.	Noon.	Evening.	Total.	Average Fat per cent. $\times 4$.	Lactation.	Total.	
			Lb.	1932	1932		1932	Lb. oz.	Lb. oz.	Lb. oz.	Lb. oz.				
Class 211 1334 1335 1336 1337 1338 1339 1340	Mrs. Evelyn . . .	Jersey, Twice Milked.		Mar. 14, 1928	April 8	90	—	25 4	—	26 0	51 4	4.55	51.25	73.95	Fifth Prize
	Miss Horten . . .	War Hawk . . .	931	Jan. 8, 1921	Mar. 23	108	May 25	26 8	—	21 0	47 8	4.77	47.50	72.38	Reserve Number
	H. C. J. Phillips . . .	Frederick's Joy . . .	924	Jan. 8, 1921	Mar. 23	108	—	30 0	—	23 0	53 0	4.47	53.00	72.38	Fourth Prize
	H. C. J. Phillips . . .	Daisy Baking Star . . .	968	Feb. 24, 1923	April 14	87	—	22 8	—	18 8	39 0	4.47	42.00	65.88	H.C.
	E. A. Strauss, M.P. . .	Blanch . . .	927	Oct. 28, 1928	April 1	120	May 19	22 0	—	21 0	43 0	4.50	42.00	71.80	H.C.
	E. A. Strauss, M.P. . .	Today's Tassel . . .	910	Jan. 28, 1927	Mar. 9	97	—	22 0	—	13 0	35 0	4.50	64.00	1.20 80.80	Second Prize
	Capt. D. F. Lathgow . .	Society Engagement . .	672	June 12, 1923	May 16	63	—	13 8	—	19 8	24 0	4.80	24.00	3.00 45.00	H.C.
Class 212 1411	Newton H. Steel . . .	Kerry, Thrice Milked.	1008	Aug. 10, 1924	April 16	82	—	14 4	8 4	11 4	33 12	5.62	33.75	4.20 60.43	Third Prize
		Muscovite Moscow . . .													
Class 213 1407 1408	Laurence Currie . . .	Kerry, Twice Milked.	893	May 19, 1926	Mar. 5	124	June 22	18 12	—	16 4	35 0	3.70	36.00	4.00 40.80	Fat below Standard
	Miss H. K. A. Gossling . .	Minley Lolly . . .	924	April 17, 1926	April 30	63	—	24 8	—	21 4	45 12	3.43	40.70	2.80 62.23	Second Prize and R.N. for Blunthurst Challenge Cup.
1408 1409	Kerry Cow Dairy Farm.	Drumgunnagh Tango . .	1015	June 19, 1928	Mar. 21	108	—	18 4	—	15 12	34 0	2.60	34.00	5.00 40.40	Fat below Standard
	H. B. Mitchell . . .	Art Ocean Dove . . .	1060	May 11, 1923	June 15	22	—	23 4	—	25 0	53 4	3.80	63.25	NH 68.85	First Prize and Blunthurst Challenge Cup.
Class 213 1431 1432	Mrs. C. M. L. Calvert . .	Decker, Twice Milked.	679	April 8, 1923	Mar. 7	22	May 3	14 0	—	12 0	26 0	3.40	26.00	8.20 47.60	Second Prize and R.N. for D.C.S.
	A. J. Creed . . .	Banwell Opaline . . .	742	June 1, 1924	Mar. 31	186	June 11	19 0	—	15 12	34 12	3.40	34.75	5.80 54.15	First Prize and R.N. for D.C.S.
1437 1438	Lady Loder . . .	Grinstead Nightingale 3rd	651	Dec. 19, 1925	April 29	69	—	21 0	—	18 0	39 0	3.80	39.00	2.80 55.10	First Prize and R.N. for D.C.S.
	Lady Loder . . .	Grinstead Tropaeolum 2nd	683	Aug. 28, 1926	May 20	43	—	14 8	—	10 8	25 0	4.08	35.00	1.80 49.00	Insufficient points
1441 1442	Mrs. T. H. Peyton . . .	Byford Hollyhock . . .	819	May 10, 1923	April 14	84	June 27	9 8	—	19 0	28 8	3.60	28.60	4.40 47.30	Insufficient points
	Mrs. T. H. Peyton . . .	Colomandy Mary . . .	781	Mar. 22, 1928	Mar. 22	107	—	17 4	—	16 8	33 12	3.40	33.75	5.00 52.35	Reserve Number
1443	Mrs. T. H. Peyton . . .	Gaynes Gay . . .	686	Mar. 14, 1925	April 11	107	—	19 4	—	17 0	36 4	3.17	36.25	4.70 52.63	Third Prize

points, whilst "Milkmaid 33rd," with a 71-lb. yield, was second with 91.10 points. Indeed, the whole South Devon section put up a very good performance, after a two-years' absence from these contests.

"Grundisburgh Wanderer" was first in the Red Poll classes with 77.4 points, her milk yield being 61 lb. daily.

Amongst the British Friesians, despite her 9 years, "Chad-desley Hedge Rose 2nd" led for the fifth consecutive year, with a daily yield of 92½ lb. She won with 107.02 points, "Lavenham Chancery 3rd" gaining 96.97 points.

The best Ayrshire was "Hillowton Lavender," which with a daily yield of 83 lb. gained 97.40 points.

Amongst Guernseys, Mrs. Jervoise came first with "Herriard Sweet 4th," with 78.38 points, whilst Mr. Grosvenor Berry's "Black Art's Post Girl" won in the Jersey section with a yield of 62.25 lb., repeating her good performance of 1931.

Kerries showed up well with a milk yield of 53.25 lb. by "Ard Caein Dove," and total points 68.85; the best Dexter, "Grinstead Nightingale 3rd," having a milk yield of 39 lb. and a total of 55.10 points.

Following up last year's figures as to yield of milk from the corresponding average breed live weights, these yield positions are reversed, the leading breeds this year being:—

TABLE II.

Ayrshires	1 lb. of milk per	18.2 lb. live weight,	average age	6 yrs. 2 mths.
Jerseys	1 lb. " "	18.6 " "	" "	5 " 6 "
British Friesians	1 lb. " "	18.9 " "	" "	6 " 10 "
Blue Albions	1 lb. " "	19.1 " "	" "	5 " 10 "
Lincoln Reds	1 lb. " "	21.2 " "	" "	7 " 9 "

The average age varied between 5 years 2 months for the Guernseys to the 7 years 9 months in the case of the Lincoln Reds.

TABLE III.—Average Results obtained in the Milk Yield Classes.

No. of Cows competing.	Breed.	Live Weight.	Days in Milk.	Yield of Milk.	Fat percentage.	Total points.
		Cwt. qr. lb.		Lb. oz.		
7	Dairy Shorthorn . . .	12 0 26	39	63 2	2.94	75.50
5	Lincoln Red . . .	13 0 7	39	69 4	3.11	81.95
6	South Devon . . .	13 0 27	71	66 9	3.83	83.80
5	Red Poll . . .	11 3 3	54	55 3	2.85	69.89
4	Blue Albion . . .	11 1 19	29	66 14	2.81	78.43
11	British Friesian . . .	13 0 3	42	76 15	3.04	89.30
8	Ayrshire . . .	10 1 16	27	63 15	3.76	78.44
9	Guernsey . . .	9 1 3	54	47 0	3.03	64.60
12	Jersey . . .	7 3 7	98	47 0	4.25	69.91
5	Kerry . . .	8 2 27	81	40 6	3.64	53.14
7	Dexter . . .	6 2 3	88	31 14	3.47	50.33

TABLE IV.—RESULTS OF BUTTER TESTS AT SOUTHAMPTON, 1932.

CLASS 214A.—COWS EXCEEDING 900 LB. LIVE WEIGHT.

No. in Catalogue	Exhibitor.	Name of Cow.	Live weight.	Date of birth.	Date of last calv.	No. of days in milk.	Date of last Service.	Milk yield in 24 hours.	Butter yield.	Ratio, vis. lb. milk to lb. butter.	No. of points for butter.	No. of points for jacket.	Total No. of points.	Award and Remarks.
		Dairy Shorthorns. Thrice Milked.	Lb.	1932	1933	1932	1932	Lb. oz.	Lb. oz.					
768	Dabenhams & Torsy.	Anderson Wild Eyes 8rd	1421	Apr. 24, 1925	June 18	19	—	68 8	1 6½	48-71	22-50	Nil	22-50	Ratio over 80
787	J. Pierpont Morgan	Aldenhams Kirkclevington	1470	June 15, 1927	June 4	38	—	79 8	2 1	88-64	33-00	Nil	33-00	Ratio over 80
788	J. Pierpont Morgan	Lady 8rd	1468	Jan. 9, 1928	May 26	42	—	68 0	1 2	86-00	18-00	20	18-20	Ratio over 80
798	Capt. Arnold S. Wills	Dairy Shorthorns. Twice Milked.	1386	June 16, 1927	June 3	34	—	65 12	3 5½	10-06	53-50	Nil	53-50	4th Prize
880	John Evans & Son.	Lincolnshire Red Shorthorns. Thrice Milked.	1400	May 21, 1922	May 19	49	—	69 4	1 10	48-61	26-00	90	26-90	Ratio over 80
844	John Evans & Son.	Brookline Recorder.	1540	Oct. 17, 1923	May 30	38	—	72 0	1 15	87-16	31-00	Nil	31-00	Ratio over 80
846	John Evans & Son.	Burton Jones 6th	1879	Sept. 7, 1926	May 25	43	—	68 12	1 15½	82-38	31-50	90	31-50	Ratio over 80
848	Frank Subbary.	Burton Ruby Spot 23rd	1554	Aug. 14, 1922	May 28	40	—	70 0	2 2½	86-64	34-50	Nil	34-50	Ratio over 80
950	Russell Wood.	Scotchman Sunbeam 10th	1442	May 16, 1928	June 10	27	—	62 4	2 2½	28-87	34-50	Nil	34-50	Ratio over 80
971	Darlington Hall, Ltd.	South Devon. Thrice Milked.	1624	Nov. 28, 1927	June 3	34	—	69 0	2 12	25-09	44-00	Nil	44-00	Ratio over 80
972	Darlington Hall, Ltd.	Darlington Hilda.	1540	(6 years)	Apr. 21	77	May 29	55 12	2 8	25-49	35-00	8-70	38-70	Ratio over 80
974	Darlington Hall, Ltd.	Milkmaid 8rd	1428	Feb. 10, 1926	Mar. 12	117	—	71 0	2 0½	84-05	32-50	7-70	40-20	Ratio over 80
976	Darlington Hall, Ltd.	Myrtle	1547	Jan. 28, 1926	Apr. 26	72	—	64 12	2 11	24-09	43-00	8-20	46-20	Reserve Number
976	J. T. Dennis	Snowdrop 2nd	1802	Dec. 19, 1918	Mar. 19	110	June 7	60 12	3 1	22-78	49-00	7-00	56-00	2nd Prize
1048	A. Barber.	British Friesians. Thrice Milked.	1380	Feb. 14, 1925	May 8	60	—	88 0	1 15	42-84	31-00	2-00	38-00	Ratio over 80
1044	E. G. Burton.	Limestone Snowdrop.	1508	Apr. 16, 1928	June 18	19	—	92 8	2 6½	39-47	37-50	Nil	37-50	Ratio over 80
1046	John E. Castle.	Chaddeley Hedge Rose 2nd	1248	Nov. 1, 1925	May 7	64	—	78 12	1 13	48-45	29-00	2-10	31-10	Ratio over 80
1068	Lord Rayleigh.	Cubridge Flora.	1470	Sept. 22, 1924	May 4	61	—	61 4	2 4½	28-85	36-50	2-40	38-90	Ratio over 80
1064	Lord Rayleigh.	Telling Torch 36th.	1547	July 1, 1926	June 14	23	—	86 4	2 4½	87-81	36-50	Nil	36-50	Ratio over 80
1066	Strutt & Parker (Farms) Ltd.	Telling Torch 40th.	1680	Aug. 1, 1924	June 6	32	—	75 0	2 6½	31-17	38-50	Nil	38-50	Ratio over 80
1066	Strutt & Parker (Farms), Ltd.	Lavenham Chaucery 8rd.	1688	Aug. 12, 1925	May 27	41	—	84 12	2 12	80-82	44-00	10	44-10	Ratio over 80

1087	Strutt & Parker (Farmers) Ltd.	1442	Aug. 13, 1925	Apr. 24	74	—	87	12	2	64	28-91	37-50	3-40	40-90	1st Prize Ratio over 80
1091	A. J. Creed	1393	May 6, 1927	June 20	17	—	78	0	3	10	21-92	58-00	NH	58-00	
1097	William Twentyman	1568	Jan. 7, 1927	June 8	34	—	69	12	1	15	36-00	81-00	NH	31-00	
1197	J. & J. McIntyre	966	Feb. 7, 1922	May 28	40	—	58	8	1	124	82-56	28-75	NH	28-75	Ratio over 80
1145	P. H. Sanderson	1485	Mar. 9, 1924	June 17	20	—	76	4	2	94	20-40	41-50	NH	41-50	
1148	Robert Sillars & Son	1184	May 18, 1926	June 2	35	—	66	8	2	8	26-60	40-00	NH	40-00	
1160	David Smith	1240	Jan. 2, 1925	June 7	30	—	83	0	3	24	28-80	50-50	NH	50-50	5th Prize
1163	Alexander D. Murchie	978	Feb. 16, 1929	May 28	45	—	65	4	2	4	29-00	30-00	-60	36-50	
1235	J. H. V. Collings	1008	Nov. 7, 1927	Apr. 28	70	—	57	12	2	81	22-81	40-50	3-00	42-50	
1287	Mrs. Jervoise	1184	June 24, 1926	May 12	56	—	69	8	2	121	21-59	44-50	1-60	46-10	
1360	Capt. Cosmo Douglas	1086	Feb. 17, 1928	June 8	29	—	49	4	2	04	24-25	32-50	NH	32-50	
1944	R. M. Thornely	987	July 3, 1923	May 15	53	—	42	8	1	104	25-66	28-50	1-80	27-80	Below standard
1957	Lord Swaythling	1064	Sept. 7, 1923	Apr. 4	94	—	38	0	1	11	22-51	27-00	5-40	32-40	
1958	R. M. Thornely	1082	Apr. 18, 1928	Mar. 23	101	—	45	12	1	14	24-40	30-00	5-00	35-00	
1957	Grosvenor Perry	998	Mar. 20, 1928	Apr. 1	97	—	62	4	2	41	27-20	38-50	5-70	42-20	Certificate of Merit
1928	Grosvenor Perry	992	Mar. 21, 1928	Mar. 9	120	—	53	4	1	131	28-68	29-50	8-00	37-50	Certificate of Merit
1955	William A. White	999	Sept. 2, 1928	Mar. 16	113	—	30	12	0	15	82-80	15-00	5-00	20-00	Ratio over 80
1980	Mrs. Lionel Corbett	924	Feb. 19, 1927	Mar. 30	99	—	46	12	2	41	20-40	36-50	5-00	41-50	Certificate of Merit
1894	Mrs. Evelyn	981	Mar. 14, 1926	Apr. 8	90	—	51	4	2	5	22-16	37-00	5-00	42-00	E.J.C.S. Gold Medal
1846	El. S. Mountain	952	July 26, 1928	Jan. 7	182	—	38	4	2	10	14-57	42-00	12-00	54-00	and 3rd Prize.
1838	E. A. Strauss, M.P.	987	Jan. 28, 1927	Mar. 9	120	—	46	0	2	04	22-65	32-50	8-00	40-50	Certificate of Merit
1884	W. A. Strauss, M.P.	910	June 12, 1925	May 16	52	—	64	0	2	3	29-25	35-00	1-20	36-20	Certificate of Merit
1937	Capt. E. L. Hughes, R.N.	721	Oct. 24, 1928	Mar. 28	101	—	46	0	2	2	21-65	34-00	5-00	39-00	3rd Prize
1942	Gordon McWilliam	923	Nov. 15, 1928	Feb. 26	182	—	47	0	2	2	22-11	34-00	4-00	38-00	Reserve Number and Certificate of Merit
1833	Mrs. Lionel Corbett	854	Feb. 19, 1927	Apr. 8	95	—	49	4	1	18	27-17	29-00	5-00	34-00	Certificate of Merit
1847	H. C. Pelly	889	Feb. 24, 1925	Apr. 14	84	—	53	0	2	10	20-19	42-00	4-40	46-40	1st Prize and E.J.C.S. Silver Medal
1848	Mrs. C. J. Phillips	791	Oct. 26, 1923	Apr. 1	97	—	39	0	2	51	16-64	37-50	5-00	42-50	2nd Prize and E.J.C.S. Bronze Medal

214a.—COWS NOT EXCEEDING 900 LB. LIVE WEIGHT.

BUTTER TEST TRIALS.

CLASS 214 A AND B.

Here again, though only 61 cows entered, 48 competed, being 10 more than in 1931 and the highest number since 1928. An annoying feature this year, which undoubtedly disturbed the cows at milking times, was the continuous aeroplane flying over the Showground, which I hope may be prohibited in future.

TABLE V.—Average results of cows entered in the Butter Tests.

No. of Cows competing.	Breed.	Live Weight.	Days in Milk.	Yield of Milk.	Yield of Butter.	Butter Ratio in lb.	Points.
CLASS 214A.—OVER 900 LB. LIVE WEIGHT.							
4	Dairy Shorthorn .	12 3 7	32	69 3	2 0	34.86	31.75
5	Lincoln Red .	13 0 7	39	69 7	1 15½	35.17	31.74
5	South Devon .	13 1 4	82	66 1	2 9	25.96	45.02
10	British Friesian .	13 0 19	42	77 11	2 6	32.76	38.95
5	Ayrshire .	10 1 3	34	69 14	2 7½	28.42	39.45
6	Guernsey .	9 1 17	67	48 13	2 1½	23.30	36.22
8	Jersey .	8 1 20	109	49 1	2 1	23.70	39.24
CLASS 214B.—UNDER 900 LB. LIVE WEIGHT.							
5	Jersey .	6 0 8	102	46 14	2 3	21.24	39.98

This year the South Devons have come well to the fore, leading for both the average yield of butter and number of points obtained; their butter ratio (*i.e.*, the number of pounds of milk taken to produce one pound of butter) is also good for a heavy breed.

The five prizes in the heavyweight class went to five different breeds, but first place went to the British Friesian "Hawthorn Katja," with a butter yield of 3 lb. 10 oz., the second going to the South Devon "Snowdrop 2nd."

The butter ratios varied from 1 lb. from 14.57 lb. milk in the case of a Jersey cow, 6 months calved, up to 1 lb. from 56 lb. milk for a Shorthorn cow. It will be noted that the milk yielded in these tests was of much higher quality than in the preceding three years.

In relating the live weights of the animals to their yields of butter, the Jerseys stand first, the Ayrshires second, and the Guernseys third.

TABNE VI.—MILK YIELD CLASSES FOR GOATS AT SOUTHAMPTON, 1932.

Exhibitor.	Name of goat.	Breed.	Date of Birth.	Date of last kid.	No. of kids.	Milk Yield.				Percentage of Fat.			Points.				Awards and Remarks.	
						Morn.	Even.	Total.	Morn.	Even.	Total.	Milk.	Fat. lb.	Solids not Fat.	Lactation.	Total.		
4451	Quinn 294 (Quality)	British Toggenburg	May 18, 1929	1929	149	6 9	5 4	—	11 12	—	—	—	—	7 72	3 42	1 50	—	—
4452	Miss Bruce Farre	Toggenburg	Feb. 17, 1928	1929	139	6 8	5 3	—	11 11	—	—	—	—	7 42	3 05	1 50	—	—
4453	Miss Bruce Farre	British Toggenburg	Feb. 28, 1928	1929	129	5 5	5 4	—	10 9	—	—	—	—	7 49	3 07	1 40	—	—
4454	Miss Grealy Hall	British Toggenburg	April 1, 1930	1931	97	4 15	5 2	—	9 10	—	—	—	—	7 23	3 30	1 90	—	—
4455	Mrs. M. J. Rutter	British Saanen	Mar. 11, 1929	1930	117	4 11	5 4	—	9 10	—	—	—	—	8 00	3 37	1 20	—	—
4456	Miss E. Egerton	British Saanen	Mar. 10, 1930	1931	121	6 10	6 4	—	12 14	—	—	—	—	8 00	3 37	1 20	—	—
4457	J. R. Egerton	British Saanen	Mar. 6, 1930	1931	121	6 10	6 4	—	12 14	—	—	—	—	8 00	3 37	1 20	—	—
4458	Malpas Melody	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4459	Woolington Waver	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4460	Miss Bruce Farre	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4461	Miss E. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4462	Miss E. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4463	Miss E. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4464	Miss E. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4465	Miss Emily Eldmore	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4466	Miss Emily Eldmore	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4467	Miss Emily Eldmore	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4468	Miss Emily Eldmore	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4469	Miss Emily Eldmore	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4470	Miss Emily Eldmore	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4471	Miss V. Watson	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4472	Miss V. Watson	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4473	Miss K. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4474	Miss K. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4475	Miss K. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4476	Miss K. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4477	Miss K. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4478	Miss K. Kelly	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4479	Mrs. Reed-Smith	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4480	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4481	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4482	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4483	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4484	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4485	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4486	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4487	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4488	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4489	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4490	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4491	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4492	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4493	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4494	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4495	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4496	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4497	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4498	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4499	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—
4500	Miss O. Chamberlain	British Saanen	Feb. 25, 1929	1931	446	7 1	6 4	—	13 5	—	—	—	—	9 00	4 00	1 50	—	—

TABLE VI.—MILK YIELD CLASSES FOR GOATS AT SOUTHAMPTON, 1932 (continued).

No. in Catalogue.	Exhibitor.	Name of Goat.	Breed.	Date of Birth.	Date of last kid.	No. of kids in milk.	Milk Yield.				Percentage of Fat.		Points.					Awards and Remarks.
							Morn.	Even.	Total.	Milk	Morn.	Even.	Pat. lb.	Solids not Fat.	Lactation.	Deduction.	Total.	
1457	Mrs. M. J. Butler	Raydon Casida	British Toggenburg	April 1, 1930	Mar. 31	87	4 15	5 2	5 5	15 6	—	—	—	—	—	—	16-27	—
1458	J. B. Egerton	Malpas Melody	British Saanen	Mar. 10, 1930	Mar. 11	117	4 11	4 5	4 14	13 14	—	—	—	—	—	—	15-07	H.O.
1459	J. B. Egerton	Malpas Marnald	British Saanen	Mar. 9, 1930	Mar. 7	131	6 10	6 4	6 13	19 10	—	—	—	—	—	—	19-02	—
1460	J. B. Egerton	Worlington Wavy	British Saanen	Feb. 25, 1929	Apr. 17	443	7 1	6 4	6 6	19 11	—	—	—	—	—	—	25-03	Second Prize
1461	Miss Bruce Yarrow	Danacott Danzer	British Saanen	Feb. 23, 1930	Jan. 13	175	5 11	5 5	5 8	16 8	—	—	—	—	—	—	18-70	—
1462	Miss K. Pelly	Therwyn Penelope	British Saanen	April 3, 1930	Mar. 23	103	7 1	6 6	6 13	20 8	—	—	—	—	—	—	21-18	Reserve
1463	Miss Fox	Modryn Mandoline	British Saanen	Jan. 15, 1929	Feb. 23	123	6 10	6 8	6 11	19 13	—	—	—	—	—	—	21-31	Fifth Prize
1464	Miss Fox	Brookmore Barbara	Saanen	Mar. 7, 1927	Mar. 5	123	5 14	5 8	5 11	17 1	—	—	—	—	—	—	18-80	—
1465	Miss Emily Skidmore	Heddon Shaka	British Saanen	Feb. 28, 1929	Feb. 24	133	5 5	5 1	5 6	15 13	—	—	—	—	—	—	17-25	—
1466	Miss Emily Skidmore	Heddon Shoe	British Saanen	April 18, 1930	April 6	91	7 2	6 2	6 14	20 2	—	—	—	—	—	—	20-02	H.O.
1467	Miss Emily Skidmore	Heddon Bong	British Saanen	Feb. 6, 1930	Mar. 5	123	4 7	4 2	4 5	12 14	—	—	—	—	—	—	16-75	—
1468	Miss V. Walton	Feltham Fairy	British Saanen	Feb. 21, 1929	May 7	130	6 11	5 13	7 0	19 7	—	—	—	—	—	—	15-71	H.O.
1474	Miss V. Walton	Edgemoor Elsie	British Saanen	Apr. 2, 1929	Mar. 23	115	4 3	4 6	4 6	15 9	—	—	—	—	—	—	16-25	—
1475	Mrs. C. Chamberlain	Edgemoor Elsie	British Saanen	Dec. 23, 1928	Mar. 13	715	4 3	4 6	4 6	15 9	—	—	—	—	—	—	16-25	—
1476	Mrs. C. Chamberlain	Whin of Westons	British Alpine	Feb. 23, 1930	April 12	85	8 2	7 15	7 13	23 13	—	—	—	—	—	—	13-76	Fourth Prize
1482	Mrs. C. Chamberlain	Stonkwell Tarrina	British Alpine	May 8, 1930	April 21	79	6 7	7 0	6 11	20 3	—	—	—	—	—	—	24-61	H.O.
1483	Mrs. Alexander	Stonkwell Tarrina	British Alpine	Jan. 23, 1930	May 2	65	5 6	5 11	5 8	16 9	—	—	—	—	—	—	20-72	H.O.
1485	Mrs. Browell	Wavelet of Bashley	Anglo-Nubian-Swiss	Jan. 31, 1929	Mar. 1	127	8 3	7 9	7 9	23 6	—	—	—	—	—	—	24-71	Third Prize
1486	Miss C. Chamberlain	Wavelet of Westons	British	June 21, 1929	April 3	94	8 10	8 0	8 2	24 13	—	—	—	—	—	—	25-66	First Prize
1487	Miss Grealley Hall	Webb Donna	British	Mar. 15, 1930	Feb. 23	135	4 1	3 14	4 0	11 15	—	—	—	—	—	—	13-43	—

MILK YIELD TRIALS.

GOATS, CLASSES 224 AND 225.

Twenty-seven goats competed in these Trials, which were again under the charge of Mr. T. W. Palmer. Full details will be found in Table VI.

WORKING DAIRY.

The trials and demonstrations were on similar lines to those at Warwick in 1931, but this year the entries for the Butter-making competitions again reached 180.

Eight teams entered for the Inter-county Butter-making Championship, which was won by Monmouthshire, with Devon second and Cornwall third.

The individual championship was won by Miss H. E. Mitchell (Cornwall), which county also took the third and fourth prizes, second going to Breconshire, and fifth to Devon.

The two local classes were unfortunately very badly filled with 15 entries only.

Our President's daughter, the Hon. Helen Mildmay, kindly distributed the County Championship awards, whilst Mrs. Roland Burke gave away the Championship rosettes at the close of the Show.

Once again I must thank the Dairy Staff for their ungrudging help. When all are so willing, cheerful and loyal, it is almost invidious to mention names, but I am particularly indebted to Mr. R. Gubbins, Miss Noble, Mr. Hasted and J. Bushell (the dairy foreman) for their help.

WILLIAM BURKITT.

Grange Hill,
Bishop Auckland.

THE FORESTRY EXHIBITION AT THE SOUTHAMPTON SHOW, 1932.

THE forestry exhibition at the Royal Show at Southampton was undoubtedly one of the most comprehensive that has ever been staged at this or any other show. In number of entries it was considerably larger than usual, and the quality was in every way equal to the best of former years.

Space does not permit of a detailed description of the entries in every class, but one or two of the exhibits were of such outstanding merit that they must be accorded individual notice.

Mr. J. H. Benyon, Englefield House, Reading, entered in four of the classes for boards, and in three of the classes for gates, and, in addition, sent an extremely fine non-competitive exhibit, the outstanding features of which were pieces of block flooring of oak, larch, and walnut, and a bureau top of plum, box walnut and barberry. This exhibitor was awarded the special Silver Gilt medal.

In all the classes for boards the entries were exceptionally large and the quality high. Special mention should be made of Sir George Cooper's entry in Class 4 (any other sort of coniferous timber). This consisted of five of the most perfect boards that the writer of these notes has seen.

The classes for gates were well filled and the general standard good, the larch field gate entered by The Warden and Scholars Clerks of Saint Mary College, Winchester, being particularly attractive.

Amongst the non-competitive exhibits, besides that already mentioned, the following deserve notice.

The British Wood Preserving Association:—An exhibit showing the effects of creosoting upon various timbers; also a simple plant for treatment of fence posts, etc., on private estates; useful and instructive for estate purposes.

Empire Forestry Association:—A most interesting exhibit of various species of Colonial timber, many of them in the form of beautifully converted articles.

H.M. Forestry Commission:—An exhibit showing methods of planting and types of plants used on various kinds of soil; rates of growth, maps, models, etc., of great educational value.

The Chartered Surveyors' Institution:—An exhibit devoted to the Cricket Bat Willow; examples of timber illustrating varying qualities and showing types of defects due to silvicultural, mechanical, and pathological causes. One of the most interesting exhibits staged.

The Powell Duffryn Steam Coal Co. Ltd.:—Mining timber drawn from pits in South Wales, showing the action of earth pressure, fungal diseases, dampness, etc.

Southern Railway Company:—Underframe of English Oak, for 15-ton rail wagon; fascine revetment, showing utilisation of underwood for the protection of embankments, etc., from the action of water.

NIGEL A. ORDE-POWLETT.

Wensley Hall,
Leyburn.

REPORT OF THE JUDGES ON THE WOODLANDS, PLANTATIONS AND ESTATE NURSERIES COMPETITION FOR 1932.

THE competitions for 1932 were confined to the counties of Kent, Surrey and Sussex, the number of entries in classes being forty-eight from eleven estates, an increase of seven class entries over the competition held in these counties in 1923. As might have been expected, most of the entries were in Sussex.

A special class for these counties was that for chestnut coppice. In this there were nine entries, the average per estate being 25 acres. The class for the best-managed woodland estate was unusually well filled, the judges being faced with a total area of woodland in this class of well over 12,000 acres. Judging started on the 15th of June and in order to finish before the Show opened at Southampton it was necessary on several days to work until dark. In only one case was there any failure to meet the owner or his representative, this being due to a misunderstanding about the rendezvous. The entry was, however, identified and duly judged. The judges wish to point out that they do their best to keep up to their time table and, as a rule, do so, but for various reasons this is not always possible. Awards for a class are never made until all entries have been seen by the judges, even if they have to return for the purpose.

One of the most striking points noticed during the tour was the interest being taken in the raising of crops, especially of oak and Scots pine, by natural regeneration. One of the most successful examples of the latter was seen on the Marquis Camden's estate at Lamberhurst, where simple wiring in of an area of several acres in the centre of a large pine wood has resulted in the production of a very level and sturdy crop of young trees. Successful oak regeneration was also seen in several cases, the most striking being that at Petworth where there were over 50 acres in one block. Another interesting fact was the very large area, running into many hundreds of acres, under Spanish chestnut. It was stated that the production of chestnut poles is not quite so profitable as it has been in the past, and on certain estates, notably Bayham Abbey, the poorer areas are being brought into high forest. At Bayham the practice of growing larch with chestnut coppice has been largely adopted in the past, the larch being either taken out as thinnings as the chestnut grows up or, if the chestnut does not promise well, left to grow into high forest. In no case did the overwood appear to exercise any definitely damaging effect on the coppice.

An interesting experiment in the planting of oak at Bayham is worthy of special notice. Twenty-one acres were planted up with 2-year seedlings at a cost of 25s. per 1,000 plants, a notch being made at the bottom of the hole to take the tap root. The area, left to itself for a year, rapidly became covered with bracken and bramble. Considerable loss was feared, but on removal of weeds the trees were found to be growing extremely well and losses were negligible. It was suggested that the blanks to be beaten up this autumn be filled with beech in order to provide humus and rather more shelter.

A comparatively new market for Scots pine poles was to be seen where estates had sold picked stems to the General Post Office authorities for telephone work. There appears to be a steady and increasing demand for trees suited for this purpose and it appears that a type of "partial felling" for this purpose not only does not affect the final crop to any extent, but is a really lucrative proposition, the timber often fetching considerably more than treble the price obtained in the ordinary way. Trees of course have to be picked. They must be straight, free from bad knots and flaws, and are classed into three grades as follows :—

<i>Light poles :</i>	Length, 15 to 20 feet. Top diameter, 5 inches. Bottom diameter, 6 to 9 inches.
<i>Medium poles :</i>	Length, 24 to 65 feet. Top diameter, 5 to 7 inches. Bottom diameter, 8 to 14 inches.
<i>Heavy poles :</i>	Length, 28 to 65 feet. Top diameter, 8 to 10 inches. Bottom diameter, 10 to 16 inches.

Price appears to depend on the class, a higher price per foot being paid for the heavier poles. Poles must be felled and crosscut by the estate before being inspected, but we were informed that the percentage of rejections was low, as was to be expected, Scots poles being easy to judge as regards cleanliness and general quality by any forester who knows his business.

The planting of hardwoods, especially oak, appears to be attracting considerable attention in these counties. A wish to grow oak was expressed in several cases, the hesitation being generally not a question of the future, *i.e.*, comparative slowness of growth or difficulty in selling thinnings, but of initial cost. It was pointed out that to-day oak planting is cheaper than it has been for years and that estates can plant far more cheaply than could the State, the reason for this being based on grants (if and when available) and on deductions from Income Tax. It was pointed out that by putting areas into Schedule D, repayments on Income and

Super Tax could be obtained up to 10s. in the £ on the net cost of planting, *i.e.*, gross cost less Government grant. Again, where death duties are payable a replacement value may be deducted from the gross cost of replanting. When all these points come into consideration the actual cost of planting oak is small and where, for example, oak planting unaided by the State (*e.g.* oak planting by the Forestry Commission itself) might cost £12 per acre, the same acreage planted in the same way by a private individual might in the end cost no more than £2 per acre.

The question of thinning in coniferous woods cropped up several times and as might be expected most estates appeared to accept the theory that comparatively heavy thinning in the early stages is a good thing to practise in larch woods. It was, however, noticed in one or two cases that this had been started comparatively late in the pole stage, too late, in fact, for safety as regards wind damage. On one estate the age appeared to be the predominating factor; in our opinion this is a dangerous criterion to adopt, the actual condition of the block being a far more important guide as to whether it is necessary to thin.

Another important question brought up was one of finance, *viz.* whether early thinnings should be made at a time when they are difficult to dispose of or whether they should be left until the market improves. There seems to be little doubt that, except with species such as Scots pine, ash or oak that stand crowding in the early stages, the final loss in value will not be balanced by the initial saving in labour. This applies rather more to pure wood than to mixtures, provided always that the more important species of the mixture are predominant and therefore in a position to suppress their neighbours by natural means. In a block where growth is regular throughout—a definitely artificial situation—it follows that definitely artificial means must be adopted to reach a satisfactory final position.

Taking the competitions as a whole, the impression gained was that in this part of England forestry is in a very healthy condition. We were particularly impressed by the fact that on practically every estate visited the management was definitely progressive and in no case content to drift on in old ways. There was also a pleasing absence of the “amateurism” evident on some estates visited in previous years. When it is more fully realised that woodland, as an economic asset to the estate, needs highly skilled management, not only as regards raising trees but also in taking advantage of every outlet that presents itself for profitable sale, then the parrot cry that “forestry does not pay” will become a thing of the past.

Little insect damage was to be seen. Ash bud moth in one or two cases had done some damage and Pine Tortrix was evident in several plantations of Scots pine. Pine weevils appeared to be giving little trouble except in isolated cases. As regards disease, most estates could show examples of larch canker, and on one estate Honey fungus (*Armillaria mellea*) appeared to be endemic. *Rhabdocline* was noted in one or two places.

A curious type of leaf variegation in woodland oak was seen at Kingsdown Wood on the Torry Hill estate, the leaves being almost white and presenting a most striking contrast to the normal leaf of the surrounding trees. This type of "sport" is probably due to certain soil conditions, but there is as yet no definite reason given by botanists to account for it.

There seemed to be a diversity of opinion about mixtures with ash as the hoped-for final crop. In some cases it was to be seen planted in alternate lines with larch, but opportunity of observing this mixture at different ages proved it a difficult one to control, and it is astonishing how soon the ground becomes covered with weeds. We are of opinion that planting in patches of four or five ash would be safer and that some sort of ground preserver such as beech or Spanish chestnut must be introduced if underplanting is not contemplated. By planting in such patches the best tree can be favoured and the remainder need not be cut out until the surrounding species are pressing closely enough to fill fairly rapidly the gap caused by their removal. On chalk and similar soils it will be found that beech gets away over ash and this is the case also with larch. Planting in groups will neutralise this to some extent, but it is often better either to plant fairly big ash or else to cut over the beech at the collar after the second year.

Apart from occasional rabbit damage, the only instance of animal damage worth mentioning was a case where young larch bent down by snow had been barked from tip to collar by field mice.

The judges desire to express their gratitude for the hospitality received from competing owners and their agents, and especially wish to thank Sir George Courthope, whose interest and kindness did so much to make the tour a very pleasant task indeed.

AWARDS.

CLASS I (a). *Hardwoods (10 to 25 years).*

No award made.

CLASS I (b). *(Over 25 years).*

The Silver Medal was awarded to Lord-Leconfield for a block of naturally regenerated oak in Petworth Park, 27 years

of age. The block was a selected 4 acres, but the remaining 44 acres appeared to be equally good. The trees were extraordinarily regular, appearing as if they had been planted, but this was of course not the case. They seem extremely vigorous and healthy and to have suffered little, if any, damage from *Tortrix viridana*, the Oak Leaf Roller Moth, which is endemic in this part of England. The trees are standing at intervals of roughly $6\frac{1}{2}$ feet, giving 1,000 stems per acre. Height 30 feet, and diameter breast high 3 inches. The crowns are, for trees of this age, very full and canopy is practically unbroken. The trees are Sessile oak and it is stated that there is no doubt that in this part of the country this variety of oak is far more resistant to attack by *Tortrix* than is the pedunculate variety of oak. Should this area grow on as it promises to do it will probably be one of the finest examples of block regeneration in this part of England. Its establishment was inexpensive and consisted chiefly of weeding, cleaning and thinning amongst the regenerated crops.

The Bronze Medal was awarded to Lord Cowdray for Oaters Wood, Midhurst. This again was a naturally regenerated area with a certain number of introduced transplants. In 1900 this area was practically bare of trees; regeneration came up rapidly and in 1914 it was necessary to thin in some places. Growth has proceeded very rapidly, many poles being 60 feet in height with a clear length of 35 feet. There is a considerable competition between the ash and chestnut for supremacy, but the chestnut is very definitely beating the ash, and is also more plentiful. Chestnut growth on this area is very rapid, a fact not surprising when the size of old trees on the edge of the area is realised, these varying in content from 300 to 800 cubic feet.

The history of this wood is interesting. After felling, the ground was rapidly covered with brambles and wild raspberry. The wood contained a good number of rabbits and for fear of these the weeds were left untouched and the young plants had to fight their way through without artificial assistance. The plantation has been thinned several times and even now might be thinned again. We estimated 300 poles per acre with an acreage content of 2,500 cubic feet. A comparison with P. T. Maw's "Yield tables for first quality chestnut and ash highwood" is of interest:

Chestnut : Age 29 : No. of trees 370. Height to tip of tree, 58 feet.
Contents per acre : 2,450 cubic feet.

Ash : Age 31 : No. of trees 280. Height to tip of tree, 61 feet.
Contents per acre : 1,490 cubic feet.

CLASS II (a). *Conifers under 20 years.*

The Silver Medal in this class was awarded to Colonel Sir George Courthope, Bart., M.C., M.P., for Hollowfield Plantation.

This area was planted up in 1922, being old pasture on which the upper part of the soil was sliding badly. It consists of a mixture of conifers, Sitka Spruce predominating, and including Japanese larch, Scots pine and Douglas fir. The pine are growing very rapidly, but the Douglas are inclined to be yellow and show the result of past attack by *Chermes Cooley*. There are a few patches which owing to wind damage require replanting, but on the whole the plantation is a thoroughly successful one. The healthy and rapid growth of Sitka spruce is perhaps the most noticeable thing about it. It is also interesting to note that the planting up of the area appears to have successfully checked the landslide. The trees were planted at 5-foot intervals, being 2 year-2 year transplants at the time.

The Bronze Medal in this class was awarded to C. J. A. Evelyn, Esq., of Wotton, Dorking, for Townhurst Wood, an area of 6 acres carrying a crop of Douglas fir 18 years of age, originally planted at 3 feet apart at a stated cost of £6 per acre. The trees are 35-40 feet in height and the crop at a rough estimate is about 1,700 cubic feet per acre. It is possible that in later years wind damage may occur, but at present the crop appears both satisfactory and well cared for. Extractions from the stem by means of Pressler's borer show the percentage annual increment to be somewhere about 8 per cent. at present. The number of stems on the ground is 900. It does not appear to be quite up to Quality I standard as shown by "Yield Tables," but should make a good Quality II Stand if matters progress as satisfactorily as they have done up to the present.

CLASS II (b). *Conifers over 20 years.*

The Silver Medal in this class was awarded to Skents Wood, an 8-acre block of larch on the Bayham Abbey estate belonging to the Marquis Camden.

This block is particularly interesting as it was awarded the Silver Medal for the younger class of conifers at the age of 12 years (R.A.S.E. Plantations Competition, Kent, Surrey and Sussex 1923). It is now just over 20 years, and its condition says much for the care that has obviously been taken of it in the past. The soil is clay loam. The ground is beginning to get weedy, but only to a minor degree and less than might be expected in a light foliated crop of this type. In 1923 there were about 1,500 trees per acre

averaging about 1 cubic foot per tree. To-day a sample acre showed 872 trees averaging about 45 feet in height, and showing an average increase in height of about 18 inches per annum in the last eight years. At the present time average quarter girth at breast height is between 4 and 5 inches, giving a total content per acre of just over 3,000 cubic feet. The crop appears very vigorous at the moment, and there is little disease apparent. The method of thinning on this area in the future will be a slight cutting out every five years or so, according to the prospects of sale. The Gold Medal offered by the Royal English Forestry Society for the best plantation entered in the competition was awarded to this area.

The Bronze Medal in this class was awarded to Lord Cowdray for a plantation of larch and Douglas fir known as Budgenor Hill, on the Cowdray estate, Midhurst.

This plantation, now 21 years old, stands on the greensand formation. Planting 4 feet apart. First thinning 1924. The lower portions of all stems are particularly clean, this being due to the fact that chisel pruning has been done in the past. The Douglas fir block contains about 650 trees per acre, timber height being about 35 feet and total content well over 3,000 cubic feet per acre, in spite of the fact that over 1,000 cubic feet have been recently removed as thinnings. If anything, the plantation is growing too fast and putting on too much annual increment; borings with Pressler's instrument showed three and four rings per inch, this giving a percentage current growth of between 12 and 15 per cent. Owing to the fact that these trees are increasing very rapidly in height, Schneider's formula as used in this case is really inapplicable, but it at any rate gives some idea of the rate at which timber is put on in fast-growing plantations of this type. It corresponds very definitely with the Quality I class for Douglas fir as laid down in Forestry Commission Bulletin No. 10, "Growth and Yield of Conifers in Great Britain." The larch is growing well and appears of good quality. At the present time the timber height (down to $1\frac{1}{2}$ inches diameter) is about 35 feet, with a height to tip of 50 feet, and the content was estimated at 2,500 cubic feet. There is a small amount of canker to be seen, but the affected stems are being removed. This is a satisfactory block on the whole, the presence of the small block of Douglas fir making comparison between the growth of the two species an easy matter and lending additional interest to what is already quite an interesting area.

CLASS III. *Mixed Woods.*

No award was made in this class, the entries, though interesting in themselves, being considered of insufficient merit.

CLASS IV. *Exotic Species.*

Only one entry was received in this class, but it was considered that in the circumstances an award was definitely justified. This is a block of Japanese Black pine (*Pinus Thunbergii*) growing on the Tilgate estate, Surrey (C. G. A. Nix, Esq.). It was stated that the seed was supplied as being that of Corsican pine, but the short stiff leaves and the white threads on the grey buds show the characteristic differences which enable *Thunbergii* to be separated from its Mediterranean relative. The trees, 7 years since planting, are now 7 feet in height and during the last year have put on 15 inches. They are growing on a valley slope on clay soil with a southerly aspect, and were planted by mattock at 3 feet 6 inches intervals at a cost of £12 10s. 0d., including netting.

A Silver Medal was awarded to this very interesting entry.

CLASS V. *Chestnut Coppice.*

This was a most difficult class to judge owing to the high standard achieved in practically every estate entered. Chestnut coppice for polewood is an old Sussex industry, due doubtless to the necessity for poles that will remain sound underground for use in the hop gardens. Owing to the increased use of wire the demand is now small, but a comparatively new industry, that of split fencing, has up to now absorbed practically all the chestnut that comes on the market. It was stated that prices are not quite so good as they were a few years ago owing to decreased demand and a certain amount of competition from the continent.

The stools stand from 4 to 5 feet apart and the usual rotation is 12 to 14 years. For walking sticks the rotation is generally 3 years, 2-year shoots being occasionally found large enough for the purpose. On good soils growth is very rapid and first year growths have been as much as 8 feet. Chestnut under standards is not approved of, as a rule; it tends to crooked poles owing to the fact that they twist towards the light; under very light shade, however, such as that thrown by larch, this twisting appeared to be absent, at any rate in the areas inspected where this method of cultivation had been adopted. In the majority of cases the coppice was grown as a distinct crop without any overshade. In view of the after-effect on the stools considerable importance was attached by the judges to their condition after cutting and it was noticeable that where the cutting was bad it had in practically every case been done by the buyer.

Prices vary very much, but it appears that £14-£16 is a very fair price to-day. Five or six years ago prices were very

much higher, one estate visited having obtained over £40 per acre for selected pieces and another £85 for an area of $2\frac{1}{4}$ acres; the same piece on the previous cut in 1913 realised only £7 4s. 0d. The fall off in price is considered to be due to the slowing down of large housing schemes, for which many miles of split chestnut fencing were utilised. The history of one piece in Sussex was given in detail, and is given hereunder as being a very fair example of the return from coppice areas in this part of England.

Area	12 acres.
Rotation 1908-19	7 years (Hoops).
Rotation 1923 onwards	14 years (Poles).
Highest price per acre (Hoops)	£9 (1912).
Highest price per acre (Poles)	£42 (1927).
Price per acre 1932	£21 10s. 0d.
Average per year per acre 1908-31	£1 2s. 11d.

The Silver Medal was awarded to the Bayham Abbey estate for four cants varying in age from 2 to 12 years and grown under a light overwood of larch which, as has already been stated, did not appear to have affected quality in the least. The stools have been well cut and the areas are well stocked up. Prices up to £22 per acre have recently been obtained. The method of establishing chestnut here is as follows:—

A mixture of chestnut and larch is planted, the hardwoods at 5×5 and the larch at $5 \times 2\frac{1}{2}$, giving 3,484 larch and 1,742 chestnut per acre. At the end of the first rotation (of about 12 years according to growth) the chestnut is coppiced and a good many larch are removed. At the end of the next cut the chestnut have about 4 poles per stool and double that at the third cutting. The advantage of this method is that, even if the chestnut is not quite as good as it might be if grown pure, the return from the larch more than compensates for any loss and if by any chance the chestnut market deteriorates the larch can be grown on in ideal silvicultural conditions, the ground being kept clean by the chestnut. Hence there is no need to feel that the ground is being occupied by a non-revenue-producing crop.

The Bronze Medal was awarded to Kingsdown Wood belonging to D. Leigh Pemberton, Esq., of Torry Hill, near Sittingbourne, for chestnut as a pure crop. The stools were good, cutting very fair, and the general management and appearance of the crop very satisfactory indeed.

Re-stocking is done by layering and inferior poles are utilised as hurdles, etc., for estate use.

The judges wish to commend highly the chestnut coppice on the Cowdray estate, which has shown an average rental of over £2 per acre for over 80 years. The average rotation

adopted here is 11 years, but on good soil the poles can be utilised at 9 and 10 years of age. The estate specialises in shoots for walking sticks, over 20 acres being sold annually for this purpose.

On Lord Leconfield's estate at Petworth the management appeared good and prices realised proved that the quality of poles was high, and this estate is commended.

The judges consider that the regulations for this particular class need even more careful laying down than has been done. They suggest that some ruling should be made as to what constitutes an "estate," as in one case a section of chestnut was shown in an outlying wood over five miles from the main estate on which the remaining portion of the entry was standing. No objection was made, as the entry was in accordance with the regulations, but for various reasons it would be well in future to ensure that entries are reasonably close together.

CLASS VI. *Estate Nurseries.*

The Silver Medal in this class was awarded to Lord Cowdray for the forest tree nurseries at Cowdray Park, Midhurst. These nurseries are three in number, a large permanent nursery and two smaller ones situated in or near the Park itself. The largest nursery extends to about 3 acres, is situated on greensand and has a south-westerly aspect. Part of this is always under a cleaning crop. This nursery is open on all sides, is very well kept and is one of the most imposing estate nurseries we have ever seen; we consider that Mr. Thomas Roberts, the head forester, has every reason to congratulate himself upon it. At the time of inspection the stock was looking extremely healthy and with few exceptions the seed beds showed an excellent "take." An interesting feature of this nursery was the number of varieties of larch, also examples of Hybrid larch raised from seed gathered on the estate. A considerable amount of Hybrid larch from Dunkeld was also to be seen in the shape of 2 yr. 2 yr. transplants for planting out in the autumn. The average height of these trees was about 33 inches. In comparison the trees from homegrown seed averaged 24 inches as 1 yr. 1 yr. plants. Other varieties were *L. sibirica* and *L. decidua forma polonica* (Sudetic). Amongst other flourishing conifers were varieties of cedar, the total stock being 1,800, and a particularly fine collection of *Pinus Murrayana* (12,500). Amongst the hardwoods Spanish chestnut predominated as was to be expected with such a large area of chestnut coppice on the estate; the plants were particularly good. A considerable number of trees are being grown as standards, these including varieties of walnut and cobnut, and there are considerable numbers of scarlet oaks.

The Park nursery is on a sandy loam and is used entirely for transplants. The soil appeared if anything better than that of the permanent nursery, this however being not necessarily an advantage.

The total nursery stock is given as :—

Conifers	.	.	.	.	.	.	375,500
Hardwoods	.	.	.	.	.	.	55,900

or 431,400 plants in all. The labour for the nurseries consists of three men at a cost of £240 per annum, plus a small amount of casual labour in the busier periods.

The Bronze Medal for the class was awarded to Mr. C. G. A. Nix for his estate nursery at Tilgate, Surrey. The site is a sandy loam and the nursery was characterised by turf paths, which apparently do not cut up easily and certainly add to the appearance. It is surrounded on the north and east sides by a particularly fine *Thuya* hedge planted in 1918 and kept to about 8 feet in height. This is particularly even and free from gaps of any kind, although of considerable length, and throughout its life has been pruned with the knife only, providing excellent testimony to the superiority of this type of treatment over the shears so frequently used elsewhere.

All plants are raised from seed, part estate collected and part purchased, and plants not required are sold off.

Costs of production have been worked out in all cases and include cost of seed, transplanting and weeding; some of these are worth recording :—

Variety.	Age.	Origin.	Cost per 1,000.	Value.
Larch	1 yr. 1 yr.	Trade	15/6	30/-
Scots Pine	2 yr.	Trade	12/10	20/-
Beech	2 yr.	Estate	2/2	20/-
Chestnut	1 yr. 1 yr.	Estate	20/-	35/-
C. Lawsoniana	2 yr. 1 yr.	Estate	13/-	50/-
Oak	2 yr. 1 yr.	Estate	15/-	32/-

The sales book showed very clearly that where a local market can be worked up, as it has been done here, casual sales are very profitable and go a long way towards lessening the cost of upkeep.

Apart from forest species, all of which appeared very healthy, this nursery contains a very considerable variety of ornamental and other conifers and shrubs. Its general appearance as a whole was particularly good and although smaller than the majority of the nurseries inspected it is, we consider, well worthy of the award made.

The estate nursery on the Marquis Camden's estate at Bayham Abbey is highly commended.

The area is $1\frac{1}{2}$ acres and the soil is a clay loam rather on the heavy side. The seedbeds were rather patchy, this being put down to frost damage. The appearance in general was good and the transplants, consisting of the usual forest species, were healthy and well grown. The annual average output of transplants is estimated at 30,000. They are on the short side, but examination of lifted plants showed a bushy root system of a type infinitely preferable to the tall and lanky plants produced by crowding and heavy manuring. A unique point in this nursery is the method of growing hedge plants. These are grown as a unit rather than as individuals, usually in 6-foot lengths, the idea being that where gapping or hedge making has to be done each plant is replanted in the same position in the line as it previously occupied, thus making a good and uniform hedge at once. This method of hedge raising on the estate has survived the test of very many years. The species used for the purpose are Holly, Laurel, Quickthorn and Privet. Three-fourths of the nursery was under forest trees, etc., the remaining quarter section being under a cleaning crop. A good type of estate nursery, and one that illustrates very clearly the difficulty of raising seedlings on heavy soil.

CLASS VII. For the best managed Woodlands on an estate of not less than 1,000 acres.

The Silver Gilt Medal in this class was awarded to Viscount Cowdray for the Cowdray estate, Midhurst, Sussex. The area of woodland on this estate is very large, extending to over 5,000 acres. The woods are situated chiefly on the lower greensand formation, a type of soil particularly well suited to growth of timber. There are over 1,000 acres of sweet chestnut plantations and at the date of purchase, 1910, the remainder was chiefly coppice with standards. Since that time a steady clearing and planting programme has been carried out and some hundreds of acres have thus been stocked, chiefly with young conifers. The varieties used are chiefly Douglas fir, the two spruces, Scots pine and larch, the latter usually having 20 per cent. of beech mixed with it. Where the sand is grey it was noted that larch growth appeared faster than on other types of soil. A noteworthy point about these conifer plantations, especially those on roadsides, was that all outside trees to a considerable depth were "brashed" to a height of 6 feet. This, it was claimed, reduces fire risks and enables the woodmen to get in quicker when dealing with an outbreak. As might be expected, the area is very undulating and care has to be taken as regards woods planted on south-western aspects. There are many interesting plantations apart from those mentioned in the award list, one of Scots pine known as North Heath being

especially worth mentioning. The age is 10 years, the plants having being notched 5 feet apart on a hot dry sand as 2 yr. 1 yr. transplants. There is no netting, nor was any used prior to planting. Height growth at the moment is about 15 feet and branching is slight, an interesting fact in view of the comparatively wide spacing adopted. The ground vegetation is chiefly bilberry with some fern and heather.

Another interesting area is Verdley Wood, a 390-acre block partly in a valley and partly on a slope with a northern aspect looking towards Haslemere. This was originally coppice with standards, but has been gradually cleared and replanted since the War, almost entirely between 1922 and 1927; a few acres, however, were dealt with about 1914-15. The species are chiefly larch, Sitka spruce and Douglas fir, the latter occupying the most sheltered places in the valley. This was a wise precaution, as not only is large Douglas liable to get its tip blown out on exposed sites, but young pole woods are frequently found to be very unsteady, a fault which, however, they gradually grow out of, provided no trouble has meanwhile taken place. It was stated that it is impossible to plant larch and chestnut at the same time on the best soil of the area, as the chestnut rapidly grows over the larch and kills it out. The general appearance of this area was on the whole extremely satisfactory.

On the southern half of the estate a block of Hybrid larch raised from Dunkeld seed has been established and is doing extremely well, its appearance being more promising than practically any other larch crop of its age seen on the tour. The only block to equal it was one of the same species of the same origin at Paddockhurst. Hardwoods grow extraordinarily well on the estate and there is plenty of very promising young ash. The oak varies from very bad to very good. Small beech is difficult to dispose of. To the question as to why there are no chair-leg businesses in the district similar to those of the Chiltern Hills it was answered that they had gone because they could not, owing to the action of certain estates, obtain small beech for turning at a price which would yield any profit. If this is so, it is to be regretted as a bad business move. Managers of woodlands, especially of beech woodlands, should be sufficiently "market wise" to realise that there is a basis for timber prices and that this is the price of the converted article. The turner knows what it costs him to turn, knows the price for chair legs, and must limit his offer. There is far too much vagueness in the setting of estate timber values even to-day, and not every manager of woodland can explain why his timber is worth the price he sets on it. We were informed that the price asked for small beech in some cases was ridiculous. Now the businesses have

gone, the small beech remains, and well-managed estates are suffering for the sins of others in less capable hands.

The estate nurseries are fully described under Class VI, having been awarded the Silver Medal for the class.

The estate yard is very extensive, covering over 2 acres, one of the most prominent buildings being a timber storing and drying shed of two stories, capable of carrying up to 70,000 cubic feet. Creosoting is done by the hot steeping process in a tank 15 feet by 6 feet by 6 feet. The saw mill is well equipped, power being obtained from a 20 h.p. suction gas plant. The bench for breaking down is a 35-foot automatic rack taking saws up to 48 inches, all with inserted teeth; these the head forester prefers owing to the quickness with which they can be repaired. There are two planing machines and other wood-working tools.

The trees in the park comprise probably one of the finest collections of really big trees in the south of England. An outstanding feature is "The Race," an avenue of Spanish chestnut about three-quarters of a mile in length planted in 1675. The trees are about 25 feet apart, and there do not appear to be any specimens less than 100 years old, these being replacements due to wind damage. Many trees are of really enormous size. In 1840 there were 255 trees with an estimated cubic content of 36,000 cubic feet. One fallen tree when measured was found to contain no less than 800, and another 530 cubic feet. A standing specimen was found to contain 350 feet in the first 10-foot length. A particularly fine oak on the polo ground contained 516 cubic feet in the butt alone, exclusive of heavy branches. A silver fir in the park is 130 feet high to the point where the top has been blown away and was estimated to contain about 550 cubic feet of timber. Reference must also be made to the yews of the "Close Walks." This group, probably the finest in Europe, contains 100 trees averaging 80 feet in height and girthing at breast height on an average 8 feet 6 inches. They are believed to have been planted about the same time as the Spanish chestnuts forming "The Race."

The ornamental gardens are of considerable extent and contain a number of exotic conifers all in good condition and many of great height. We do not consider that any greater proof of the power of greensand to produce fine timber could be shown than the quality and size of the park and ornamental timber on the Cowdray estate.

This estate holds one unenviable record. It appears to be the only place in England to report attack on chestnut poles by a fungus disease known in France as "Javart," and technically as *Diplodina castaneae*. The outward symptoms consist of small cankers, which are fructifications of the fungus,

the wood below being damaged. So far the attack appears to be both local and slight, but it is to be hoped that nothing more serious will occur, as in France the disease is reported to have killed not only poles but the whole stool itself.

The Silver Medal in this class was awarded to the Paddockhurst estate, the property of the Hon. Clive Pearson.

In this case the actual timber taken as a whole leaves something to be desired, but the judges were particularly interested in the way that areas of only fair quality were being managed and the way in which difficulties of considerable magnitude were being overcome. A noteworthy point about this estate is the definite utilisation of all types of estate timber, both hard and soft, for estate uses; several cottages were seen which were constructed as regards woodwork entirely from estate timbers, spruce being largely used for floor boards. The utilisation of Wellingtonia timber for barn floors was another striking instance of the utilisation practised on this estate.

The woodland extends to 1,880 acres excluding small shaws and ghylls which are usually let with the farms. The geological formation is Hastings Beds, a soft sandstone with pockets of rather difficult clay. The soil as a whole is poor and in places inclined to be thin. Rainfall is about 30 inches per annum. Oak is as a rule of only fair growth, but larch grows well in places, as does Spanish chestnut; Corsican pine and Douglas fir are promising well. A working plan was made in 1919 and put into practice the following year, 71 acres of conifer being planted. A very large purchase of land in 1921 added over 1,000 acres of woodland, so that this plan had to be scrapped and a new ten-year one prepared in 1922. On this plan operations have been carried out. By the end of this period 450 acres of conifers had been planted, bringing the total acreage of conifers up to 714. The hardwood circle laid down an area of 58 acres for the period and 65 acres were actually planted. Costs of clearing have varied from nothing (farmland converted to woodland) up to £6 per acre (heather cut by hand). General average £3 5s. 0d. per acre. Costs of planting averaged about £8 10s. 0d. per acre, against which grants by the Forestry Commission had to be set off. The average rate of planting was 300 plants per day per man, pits being dug. After-clearing of bracken, which had to be done twice, cost 16s. per acre, and in one case honeysuckle over 60 acres of land had to be cleared at a cost of £1 per acre.

It has been found on this estate that hand-picking of Pine Tortrix has justified the expense incurred, 75 acres of Scots pine having been saved at a cost of 4s. per acre. It was stated that this action has practically stamped out Tortrix on the estate except in a few isolated cases. Pine weevil was steadily trapped

for six years and at the moment appears to be practically non-existent.

The planting programme for the next decade shows a reduction, but considerable thinning operations will shortly be necessary which would otherwise have entailed increase of staff.

The plantations on the whole show distinct promise where the soil is of any depth, spruce in some cases putting on shoots of well over 12 inches in length. Hybrid larch obtained from Dunkeld as 2 yr. seedlings is growing extremely well, and rapid growth when planted at 6 feet obviates much clearing. There is also a good growth of ash in places. Hardwoods are planted wherever the soil is considered suited to them. Honey fungus is unfortunately very prevalent; so far it has not attacked Douglas fir, but pines, spruce and Japanese larch have all been affected at different times. Larch canker is found in old crops where the tree has been planted on unsuitable soils, and as a result of this practically all new crops are being mixed with beech. Fraser River Douglas has been badly attacked by *Rhabdocline* and is no longer being planted. Heavy frosts are common and have interfered with the growth of young Douglas and especially with that of spruce.

All plants are raised at home, there being two nurseries, each 2 acres in extent, the labour cost of which is estimated at £30 per acre per annum. It is considered that £10 per acre is sufficient to cover the cost of the necessary seeds and the 1-year seedlings that are bought when necessary. Woodland costings are not tabulated, but all labour sheets and particulars relating to the plantations are filed, and the cost of any particular block is extracted as and when required.

The ornamental and amenity timber is extensive and well looked after.

The sawmill is excellently laid out and very well equipped. Breaking down is done on an automatic rack, power being supplied by a 50 h.p. steam engine. There is also a Ransome band saw, the usual machinery for woodworking comprising a morticing machine, planer, etc., and a 5-ton steel crane in the yard. Costs of sawing are estimated at 6d. per cubic foot.

The Bronze Medal was awarded to Sir George Courthope, for the Whiligh estate at Wadhurst, Sussex. The woodlands here extend to an area of some 540 acres, with a considerable amount of coppice wood, chiefly chestnut. The estate is intersected by the watershed between the Rother and a tributary of the Medway. The highest point of the property is about 600 feet above sea level. From the watershed extend a number of spurs of varying length with steep slopes, many of which are covered with wood; while nearly a third of the total woodland acreage consists of long narrow gills along

the small streams in the valleys between the spurs, and a large number of pits from which ironstone or marl was formerly dug. The soil is Wadhurst clay overlying Hastings sands, which contain many pockets of spathic carbonate of iron, which formed the raw material of the old Wealden iron industry. The sandstone crops out in many places, and the clay has a tendency to slip from the ridges into the valleys.

When the present owner succeeded in 1910, the woodlands consisted almost entirely of coppice with standards, the exception being a few belts and clumps of conifers planted early in the nineteenth century, and small groups of larch, Scots pine and silver fir planted for purposes of landscape in some of the hardwood woodlands. The coppice was principally Spanish chestnut with smaller quantities of ash, hazel, and hornbeam. It had been severely suppressed in many places by the excessive canopy of oak standards. The park was heavily timbered with oaks, in parts almost amounting to high forest.

The following is the general planting policy. The natural regeneration of oak is encouraged. The best and most accessible areas of chestnut coppice are maintained as pure coppice, or with a much reduced number of standards. Areas where the coppice growth has been suppressed, or is uneconomic, are being gradually converted by the planting of conifers with groups of pure ash in selected places, and hybrid poplars (*robusta*, *generosa*, and *Eugenei*) in the wet spots which abound throughout the property. Additions to the woodland area are made by the planting up of areas of pasture, especially on slopes where the soil has slipped and left cracks and hollows dangerous for live stock. An average of 40,000 transplants are planted out each winter. At first Douglas fir predominated but this has suffered so heavily from storm damage and snow that the proportion has been reduced. Besides Sitka spruce Japanese larch and *Abies grandis* at present show considerable promise. Apart from damage by storm, snow and rabbits, the principal pest has been *Tortrix viridana*, which attacked this district for six out of seven years about 1918 to 1925. A considerable number of oak trees have failed to recover health and strength, and are definitely going back. A number have already been removed on this account. In some parts, particularly where hardwoods have been felled, Honey fungus has been destructive. Slight attacks of *Chermes viridis* and *Chermes Cooleyi* have occurred, but appear to have done little damage. The systematic planting up of woodland areas after coppice clearing, and of adjacent land considered more suitable for silviculture than for grazing, takes the place of a more formal working plan.

The chief feature of this estate is heavy stocking of oak,

chiefly in the park; a certain amount is to be found elsewhere, which, as already stated, it is hoped to keep up by natural regeneration. At the present time the annual output of oak is up to 30,000 or 40,000 cubic feet from a probable capital of some 400,000 cubic feet—an ideal hardwood proposition which should last as long as required provided re-stocking is satisfactorily carried out.

This oak is of excellent quality and appears to grow fast—felled oaks examined showed a percentage of annual increment on trees 3 feet in diameter of 4 per cent., and other trees showed a diameter of 2 feet gained in fifty years. Four annual rings to the inch is not uncommon on quite large trees. This oak is of considerable historic interest for not only was it utilised for the new beams of Westminster Hall, but the original beams of the building were also supplied from this estate. A special Act had to be passed to enable the new beams to be supplied from Whiligh owing to the fact that the owner was then, as now, a Member of the House of Commons. This estate has been carrying out experiments in silviculture for years, one of the most interesting being the growing from the stool of ash standards over coppice. Each stool was brushed to one pole about 1918 and they now stand about 20 feet apart. They average 12 inches Q.G. breast high with 20–25 feet of clean stem, and show an average annual height growth of nearly 2 feet since that date. Spanish chestnut have been treated in the same way and now stand at about 800 per acre, are 40–50 feet in height with a Q.G. breast high of 5 inches, and a mean Q.G. of about 2½ inches.

The estate yard and its shops are efficient to a degree, and the scheme of utilisation is a model of its kind. The stock consists very largely of oak, of which at the time of inspection there was about 5,000 cubic feet in stock, the butts averaging about 60 feet apiece. The plant consists of a 28-foot automatic rack bench with push bench and vertical band saw worked off a sunk counter shaft. Saws are up to 78 inches, but a 6-foot saw giving a clear 33-inch cut is chiefly used for breaking down. Power is obtained from a 14 h.p. Marshall steam engine with a large firebox for burning wood waste. Wheelwrighting on this estate cannot be beaten anywhere in the country either in respect of quality of timber or craftsmanship. Practically all the wooden implements and carts of the estate are constructed and reconditioned here, and an example of a wooden Sussex foot plough due out for work on the farms was by request kept back for exhibition at the Royal Show at Southampton.

The estate possesses a good class nursery stocked with about 100,000 plants. Seedlings, 2 yr. and 1 yr., are bought in and grown on, as the heavy nature of the soil is against successful

sowing. Ash and beech seedlings are brought in from the woods. Surplus stock is grown on and eventually utilised for dead cover in the game preserves. About 40,000 plants are put out annually.

Some underplanting is done on the estate, the most interesting area consisting of *Grandis* fir under oak, the object being to clean the oak stems and push the crowns up.

Ornamental timber is well cared for and on the old Avenue there are conifers which, owing to rather close planting, have been pushed up to an extraordinary height. As might be expected, they are now suffering somewhat from damage by wind. A certain amount of new planting takes place, but this depends very much on the amount of land where the soil is sliding and on the need for improving game coverts. Otherwise most planting is done in the old woods.

Regarding the other estates entered in this class, one would like to mention the Herons Ghyll estate owned by Lord Rankeillour.

The woodlands here are small, but there appears to be over the few hundred acres a considerable diversity of soil that has called for considerable skill in its planting. The major part of the area carries comparatively young plantations, the oldest about 25 years, and much of the land is wet and difficult. Japanese larch appears to do well in the earlier stages, but whether it will form satisfactory timber remains to be seen. A plantation awarded the Silver Medal in 1923 that had gone well for about 13 years appeared to have slowed down very considerably in the following nine years, and in our opinion should have been thinned more heavily some years since. We commend the woodlands on this estate, not so much from the point of view of quality of timber produced as for the methods of management adopted to produce timber upon a far from accommodating soil.

Another estate we wish to commend is Bayham Abbey, Lamberhurst, the property of the Marquis Camden. The woodlands in this case are nearly 4,000 acres in extent and include a very large area of chestnut coppice. We were much interested in the methods adopted for improvement of old woods and coppice land, in the new oak plantings and in the general methods adopted, which in all cases appear to have a definite object in view. As regards the ornamental timber, we are of opinion that a number of the trees planted for the purpose of commemorating visits to Bayham Abbey will hardly fulfil their object as they are obviously unsuited to the soil or situation.

A. D. C. LE SUDR.
A. AUCHTERLONIE.

REPORT OF THE JUDGES ON THE ORCHARDS AND FRUIT PLANTATIONS COMPETITION, 1932.

*(Restricted to the Counties of Cornwall, Devon, Somerset, Dorset,
Wiltshire and Hampshire and the Isle of Wight.)*

There were 55 entries in the competition this year. One entry was withdrawn during the judging period so that in all 54 orchards, plantations or strawberry plots were inspected. Judging commenced in Hampshire on June 16 and was completed in Wiltshire on June 26. As usual the itinerary as arranged by Mr. E. C. Boughton of the National Farmers' Union was found to work admirably—the southern half of the area being dealt with first and Somerset and Wiltshire on the return journey.

The same method of scoring points was adopted as in previous competitions.

Points were awarded for :—

- 15 (a) System of planting.
- 10 (b) Pruning and shape.
- 20 (c) General vigour and productiveness.
- 20 (d) Freedom from pests and disease.
- 10 (e) Land cultivation, having regard to the profitable use of the ground.
- 10 (f) Selection of varieties.
- 10 (g) Economical and commercial aspect.
- 5 (h) General appearance.

100

In the case of strawberry entries points were awarded as follows :—

- 10 (a) System of planting.
- 15 (b) General vigour and productiveness.
- 25 (c) Freedom from small plants, pests and disease.
- 15 (d) Land cultivation ; weeds.
- 5 (e) Selection of varieties.
- 10 (f) Freedom from Rogues.
- 15 (g) General appearance.
- 5 (h) Strawing.

100

The following awards were made.

CLASS 1.—Open to growers of 10 acres and over of Top Fruit, excluding Cider and Perry Fruit. Best managed plantation or orchard of Top Fruit planted not less than 8 years on stems not less than 5 feet. (Two entries.)

First (74 points). A. C. Willy, Middelney, Drayton, Taunton.

A fine area of well-managed grass orcharding consisting of "Bramley," "Newton" and "Annie Elizabeth" apples planted 30 feet \times 30 feet. The trees are well managed; of good shape and carrying a good crop in places. Aphis attacks were severe in parts of the orchard and weevil was prevalent in "Annie Elizabeth," but the vigour and hardy nature of the growth was generally most excellent. The orchard is well grazed—the fine herbage contains plenty of clover—but the pasture would obviously soon get out of hand under less good management on this type of land.

We would suggest the introduction of a pollinator among the "Bramleys."

We regret our inability to make a second award in this class.

CLASS 2.—Open to growers of less than 10 acres of Top Fruit, excluding Cider and Perry Fruit. Best managed plantation or orchard of Top Fruit planted not less than 8 years on stems not less than 5 feet. (Seven entries.)

First (78 points). R. G. Hosegood, Allen Farm, Williton, Somerset.

Four acres of "Bramley" apples on "Morgan Sweet" stock, planted 36 feet triangle system. It is interesting to note that the top working of the whole of the trees was done by ex-service men trained at the Cannington Court Farm Institute under the supervision of the County Horticultural Superintendent. This is a typical example of what a good grass orchard of standards should be. The turf is in first-class condition—heavily stocked with sheep, pigs and poultry—and the results are apparent in the splendid condition of tree growth and the appearance of the foliage.

There were slight attacks of scab, aphis and caterpillar and a little closer attention might have been given to spraying operations.

We would draw attention to the possibility of crop failure through lack of pollination and suggest the introduction of another variety in this plant of "Bramleys." Tree guards are excellent, simple and cheap.

Generally a promising orchard with a valuable future.

Second (75 points). S. J. Woodbourne, Crouchreadon Farm, Liss, Hants.

A plantation of standard apples planted 17 years, 18 feet \times 18 feet. The trees are a very uniform lot, but a little overspurred; wood is abundant and needs some thinning out, especially in the centre growth.

Varieties consist of "Bramley," "Lancs," "Newton," "Beauty of Bath" and "Worcester." There was a very good crop, but more attention to pest control was required. We regretted to see these otherwise excellent trees severely attacked with caterpillar, sawfly, weevil and woolly aphis. A few "James Grieve" were also badly cankered. Cultivation is good, the orchard is "pigged" every three years in addition to applications of farmyard manure. The orchard is also entirely enclosed from prevailing winds.

On this farm we noted that gooseberries do exceedingly well and the culture of the best dessert varieties might be profitably extended.

Reserve (65 points). F. J. Emery, Brook Lane, Botley, Hants.

Some excellent trees of "Bramley," "Newton" and "Lancs," planted 25 feet \times 25 feet, about 20 years old. These trees have the capacity for heavy cropping. Aphis and caterpillar—especially the latter—were rife in most of the trees. Scab, also, was very bad. The plantation would probably be better grassed down entirely. A good lot of trees if cleaned of pests and disease.

CLASS 3.—Open to any grower. Best managed plantation or plantations of Top Fruit, planted not less than 8 years, the majority of the stems to be not more than 3 feet, of which not less than 3 acres, or more than 10 acres, must be entered. (Nine entries.)

First (76 points). George Russell, Little Whitefield Farm, Ryde, Isle of Wight.

A 10-year plantation, planted 20 feet \times 20 feet square, consisting chiefly of dessert apples.

The entry gained high points for freedom from pests and disease. Spraying was well done—tar oil, lime sulphur, arsenate, bordeaux and dust had been applied and apart from a few isolated attacks of sawfly the plantation was very clean—scoring the highest number of points for pest and disease control in Top Fruit entries in the competition. Tree growth is fair; cultivation excellent. Inter crops are peas and other vegetables for local sale.

We found it necessary here to deduct points for too many varieties. We took into consideration, however, that on this type of holding, where local sales only are catered for, there is reason for a larger range of varieties in dessert apples to meet the local demand which the owner has established in the immediate neighbourhood for continuity of supplies.

Second (75 points). Edward Pyne, The Gardens, Topsham, Devon.

An excellent plum plantation in a high state of cultivation. The trees are 15 feet \times 15 feet, of good shape and uniform appearance, and with the exception of "Belle de Louvain," were carrying a good even crop. The entry lost points for pest control, for we noted a good deal of aphid in parts, in addition to some attacks of brown rot, silver leaf and red spider. We considered, also, that the trees had a little too much centre thickness and some branches might have been beneficially removed, otherwise the plantation was a well-managed piece of plums. The entry gained full points for cultivation.

Reserve (69 points). Lt.-Col. F. N. Q. Shuldham, The Manor, Norton-sub-Hamdon, Somerset.

The original plantation on this farm was planted in 1913, mainly for testing out suitability of varieties. "Bramley," "Lancs" and "King Pippin" remain the best trees and the crop was above average. No cultivation is done—the grass being mown where necessary. There was a large amount of scab in these trees.

CLASS 4.—Open to any grower. Best-managed plantation or plantations of Top Fruit, planted less than 8 years, the majority of the stems to be not more than 3 feet, of which not less than 3 acres or more than 10 acres must be entered. (Eight entries.)

First (78 points). Lt.-Col. F. N. Q. Shuldham, The Manor, Norton-sub-Hamdon, Somerset.

The young plantation consists entirely of "Bramley" apples planted 24 feet \times 24 feet on type II stock. Growth is exceptionally good and the foliage was remarkable in its healthy appearance. There is a good amount of bare wood in the leading branches of these trees, but owing to the rapid growth of the variety on this soil it is evident that pruning must be careful and the use of the knife restricted.

Cultivation appeared a little rough and possibly was not commenced sufficiently early in the season; we consider that the plantation should now be freed of the soft fruit under crops. Some scab and capsid was noticeable. In this pure plant of "Bramleys" a suitable variety for pollination is again recommended.

Second (72 points). Robert Wellington, Worth, Hele, Devon.

This plantation is a promising piece of "Grenadier" apples. The trees are of excellent shape, well managed, and show plenty of vigour with a capacity for heavy production. No scab spray had been applied, yet the disease was conspicuous by its absence. Some capsid and canker were

prevalent and there were a good many dead buds in some trees, but on the whole the trees are an excellent lot and doing well. Canker, unfortunately, may be a source of trouble in the future.

Reserve (63 points). N. S. Grills, Hallowell, Bere Ferrers, Devon.

A mixed plantation of apples, pears and plums planted in 1927, 15 feet square. Plums are easily the most successful trees in this orchard. Apples are severely affected with scab and the variety "Worcester" appears to canker very badly on this place. Pears—both "Conference" and "Fertility"—are doing well, but from general observations it would appear that plums on this holding are a better economic proposition.

CLASS 5.—Open to growers of Bush Fruit. Best-managed plantation or plantations of Bush Fruit planted not less than 3 years, of which not less than 2 acres or more than 5 acres must be entered. (Ten entries.)

First (89 points). Edward Pyne, The Gardens, Topsham, Devon.

This entry secured the Society's special medal for gaining most points of any entry in the competition. The plantation comprises 3 acres of "Royal" and "Red Cross" raspberries, planted in 5-foot rows, with one supporting wire on iron posts. Growth is good, vigorous and regular—as also is the crop—"Red Cross" being outstanding in this respect. Full points are awarded for cultivation and 3 points only deducted for slight incidence of aphid and mosaic.

We note there is no gangway through the middle, and without this, it would appear that a good deal of unnecessary carrying must be required when picking the crop.

Second (83 points). Viscount Wolmer, M.P., Blackmoor, Liss, Hants.

Part black currants and part blackberries; the currants are 8 feet × 3 feet, 5 years planted, and the blackberries in 7-foot rows supported by 4 wires.

Growth is very good over the plantation, the land kept in good heart by applications of dung and liquid manure.

The crop, however, had run off rather badly and owing to early attacks of caterpillars was not as good as it should have been. Full points were awarded for the thorough cultivation. The black currants are chiefly "Davidson's Eight," and the blackberries "Himalayan."

Reserve (78 points). N. S. Grills, Hallowell, Bere Ferrers, Devon.

Mixed bush fruits of black currants, gooseberries and raspberries. The entry would have scored higher but for the raspberries. The latter contained far too much old dead wood. On the other hand, the black currants were the best crop seen during the tour, "Davidson's Eight" and "Baldwin" being exceptionally good and free of either pests or disease. The raspberries had no stakes or supporting wires.

Full points were gained for the well-cultivated land.

CLASS 6.—Open to growers of 5 acres and over of strawberries. Best-managed plantation of strawberries of which not less than 3 acres and not more than 10 acres must be entered. (Five entries.)

First (81 points). Henry Peagram, Brook Lane, Sarisbury Green, Southampton.

Six acres of the varieties, "Sovereign," "Oberschlesien" and "Lefebvre."

The plants over the whole were somewhat irregular and the "Sovereigns" patchy, but a large percentage of the plants were, nevertheless, well filled with good quality berries.

Maiden plants were very good. A little aphid was noted, but the entry scored high for pest control. Cultivation and strawing excellent.

Apart from some apparent weakness in the stock of "Royal Sovereign," we considered this an excellent piece of strawberries.

Second (78 points). Robert Wellington, Worth, Herts, Devon.

Spring-planted "Sovereign" and "Oberschlesien" in 3-foot continuous rows, 2 years old. Cultivation was fair, but a good thing appeared somewhat

difficult on this stony soil. Although even and regular, the crop was on the light side, and lost a few points under this item. The system of continuous row planting, as seen here, does not appear to possess any commercial advantage. An outstanding feature, however, over the whole acreage was the remarkable freedom from pests. The entry scored the highest points, under this head, of any strawberry exhibit.

Reserve (77 points). Edward Pyne, The Gardens, Topsham, Devon.

"Royal Sovereigns" of 4 different strains. There were many very strong plants which were carrying heavy crops, but points were lost for the generally irregular condition over the whole. We understood that, as maidens, the plants were exceptional, but the piece, as 2-year-olds, had become very patchy. Aphis was also very prevalent.

CLASS 7.—Open to growers of less than 5 acres. Best-managed plantation of strawberries, of which not less than $\frac{1}{2}$ acre and not more than 2 acres must be entered. (Nine entries.)

First (80 points). Major Guy Channer, D.S.O., Woodcock House, Warminster, Wilts.

The strawberries in this entry, under garden conditions, had been exceptionally well done. The plants—"Sovereigns" (chiefly, "Tardive" and "Oberschlesien"—autumn and July planted—were very free from rogues. Vigour and productiveness, especially in the quality of fruit, were much above the average. The maiden plants were outstanding. Cultivation very good, and the land appeared in first-class condition generally. Strawing was excessive, but we understood the fine surface soil is very liable to splash during wet weather.

We were very much struck by the productive strain of "Sovereigns."

Again we found aphis.

Second (76 points). E. W. Edwards, Brook Lane, Warsash, Southampton.

Maiden "Sovereigns" November planted 2 feet \times 2 feet. The plants were strong, but there was a certain amount of irregular growth, gaps and small plants in parts of the field. Cultivation also varied, and there appeared hardly sufficient uniformity in general culture.

A little aphis was noticeable.

Reserve (75 points). Frank J. Emery, Brook Lane, Botley, Hants.

The "Oberschlesien" was doing the best of the varieties in this field. The entry lost points for gaps and lack of uniformity in growth. The prevalence of aphis was again noted.

We understand 2-year plants have produced 4 tons per acre on this plot. A feature noted on this holding was the excellent well-planned fruit shed and equipment.

V.H.C. (72 points). Mrs. M. Portal, Holywell, Swanmore, Southampton.

Cultivation, manuring and strawing were exceedingly well done, but points were lost owing to severe aphis attacks and the need for a better stock of "Royal Sovereign."

H.C. (69 points). W. J. Martin, Heathfield, St. Mellion, Cornwall.

A few rows of "Sovereigns" from the strain that won this class in the 1926 competition still remained, but the entry lost points due to patchy parts and small plants in the field other than the few rows mentioned above. The crop, however, was heavy, in spite of the weak growth. Another example of deterioration in "strain."

CLASS 8.—Open to growers of Cider and Perry Fruit. Best-managed orchard or orchards planted not less than 8 years, composed wholly or mainly of cider apples and/or perry pears, of which not less than 3 acres and not more than 10 acres must be entered. (Four entries.)

First (79 points). Williams Bros., West Town, Backwell, Bristol.

A feature of this orchard was the apple crop and it was refreshing to find trees bearing heavily after the many disappointing orchards we had seen during the tour.

TABLE OF POINTS.
TOP FRUIT AND BUSH FRUIT CLASSES.

Class	No.	Exhibitor	Award	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	Total
1	2	A. C. Willy ...	1st	12	8	15	10	8	10	7	4	74
	1	W. J. Martin ...		10	5	10	5	8	6	6	2	47
2	4	R. G. Hosegood ...	1st	15	8	13	10	10	10	7	5	78
	18	S. J. Woodbourne ...	2nd	12	7	15	10	10	8	9	4	75
	3	F. J. Emery ...	Res.	10	7	15	7	6	9	8	3	65
	5	R. Langsford ...		13	5	11	5	8	6	4	3	55
	6	W. H. Myers ...		10	8	10	6	2	8	5	2	51
	7	S. E. Saunders ...		5	7	5	0	5	8	2	3	30
	8	A. J. Wyatt ...		5	7	5	5	7	6	8	1	39
3	15	G. Russell ...	1st	14	8	15	16	8	5	7	3	76
	12	Ed. Pyne ...	2nd	12	9	15	10	10	8	7	4	75
	16	Lt.-Col. Shuldham ...	Res.	10	5	15	8	5	8	5	3	59
	9	H. L. Ford ...		4	6	8	6	0	3	3	2	32
	11	Lees & Ridge ...		7	7	12	7	1	9	5	1	49
	18	N. J. & F. Richards ...		12	8	10	5	6	5	5	2	53
	14	W. Richards ...		7	5	15	5	6	6	5	3	52
	17	Smith & Underwood ...		10	5	10	5	2	10	5	2	49
	19	YO Fruit Co. Ltd.		12	5	6	4	3	7	6	3	46
4	25	Lt.-Col. Shuldham ...	1st	15	8	15	14	5	10	7	4	78
	26	R. Wellington ...	2nd	14	8	12	12	7	9	7	3	72
	22	N. S. Grills ...	Res.	12	5	11	10	8	6	7	4	63
	20	Cornwall C.C. ...		12	3	5	5	8	8	1	1	38
	21	Dartington Hall ...		15	2	8	4	10	9	2	2	52
	23	Kingsley Fruit Fm. ...		5	9	14	5	2	6	2	1	44
	24	Lees & Ridge ...		7	6	8	6	1	10	5	1	44
	27	E. H. Wells ...		14	2	3	3	0	10	0	0	32
5	31	Ed. Pyne ...	1st	14	10	16	17	10	10	8	4	89
	36	Lord Wolmer ...	2nd	13	9	15	14	10	9	9	4	83
	29	N. S. Grills ...	Res.	12	7	15	13	10	9	3	4	78
	28	Cornwall C.C. ...		15	5	4	16	7	0	0	1	48
	30	Mrs. Portal ...		10	6	6	7	9	10	3	2	53
	32	G. Reeves ...		10	6	10	9	6	7	6	3	57
	33	N. J. & F. Richards ...		12	5	12	8	5	8	5	2	57
	34	F. G. Unwin ...		12	7	10	10	3	7	6	2	57
	35	E. H. Wells ...		11	6	12	12	2	10	7	3	63
	37	YO Fruit Co. Ltd.		13	8	10	5	6	10	3	2	57
8	55	Williams Bros. ...	1st	12	9	15	12	8	10	9	4	79
	53	R. J. Denning ...	2nd	13	9	14	10	7	10	7	4	74
	52	H. W. Davies ...		13	6	10	5	4	10	6	3	57
	54	E. H. Dyke & Son		12	7	10	8	5	6	6	3	57

STRAWBERRY CLASSES.

Class	No.	Exhibitor	Award	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	Total
6	39	H. Peagram ...	1st	10	10	18	13	5	8	12	5	81
	41	R. Wellington ...	2nd	8	10	20	10	5	8	13	4	78
	40	Ed. Pyne ...	Res.	10	9	16	14	5	8	10	3	77
	38	Kingsley Fruit Fm. ...		10	5	10	13	5	5	5	5	53
	42	S. J. Woodbourne ...		10	5	15	14	5	5	5	5	64
7	43	Major Channer ...	1st	10	13	16	18	4	9	11	4	80
	46	E. W. Edwards ...	2nd	10	12	17	11	5	7	10	4	76
	47	F. J. Emery ...	Res.	10	12	16	20	5	6	11	5	75
	50	Mrs. Portal ...	V.H.C.	10	11	12	13	4	7	10	5	72
	49	W. J. Martin ...	H.C.	10	11	17	10	5	6	10	3	69
	44	L. Cleeve ...		10	5	14	13	5	3	5	5	60
	45	Cornwall C.C. ...		10	6	14	14	2	3	5	0	54
	48	R. Mann ...		10	5	10	13	4	5	5	5	59
	51	G. Reeves ...		9	10	12	10	5	4	5	2	60

The orchard contains many magnificent trees of "Kingston Black," "Cap of Liberty," "Sweet Alford" and other vintage apples. Grazing was well done and, apart from the wet patch in the middle of the orchard, the turf was in excellent condition.

Control of such pests as aphids, however, left room for improvement, and we would strongly urge that spraying be more thorough in the future.

It is interesting to note that the same orchard scored 76 points in the 1926 competition, being then placed reserve.

The orchard has improved in every respect.

Second (74 points). R. J. Denning, Little Ashwell Farm, Ilminster.

A good example of orchard upkeep and renovation. The trees are chiefly mixed cider varieties, with some young trees of "Dabinett," "Bramley" and "Newton Wonder."

Pruning and shape were very good; trees were nicely opened and were carrying a very fair crop—"Woodbine" and "Bramley" being the heaviest.

The pasture was very well managed, although docks were plentiful in parts of the orchard.

The renovation of this orchard has been hard work against odds and its present condition is a credit to the perseverance and enterprise of the occupier.

The two other entries in this Class each scored 57 points—both losing a major portion of the points under freedom from pests and disease.

GENERAL OBSERVATIONS.

Although the entries totalled such an excellent number we believe that many good orchards and plantations were not entered in the competition. On the whole the general quality of the entries was disappointing taking into consideration the large area which was covered. In Cornwall, we feel sure, some better lots of strawberries could have been seen, and the same probably applies to Devon. We regret that the results reveal such low pointing, but at the same time marks must necessarily be withheld where the examination of each detail as outlined in the score card suggests but few points at the time of inspection.

It will be generally agreed that a higher standard is very desirable and we hope, therefore, that the low pointing in this year's competition will not discourage growers from entering their fruit holdings in future competitions. It will be seen that many orchards and plantations did not reach very much beyond 50 per cent. of the possible points. In fact, the average number of points awarded in the top fruit and bush fruit classes was under 60. Reference to the table of points will show the large deductions in many instances for control of pests and disease. We regretted to see so little attempt being made to combat pests. In many cases one met with first class cultivation but with practically no control of insect pests and disease.

Aphids was general in all fruits and in many orchards scab had taken such a hold upon the trees as to make economical improvement an apparently hopeless task. Sawfly, capsid and red spider were less severe, but canker in Cornwall was

very ripe and it is pretty safe to say that large numbers of apple trees are more or less beyond recovery.

We do not consider that apple growing in Cornwall, as at present practised, is really worth while. The trees are left very much to take care of themselves—the undercrops being treated as of first importance. We consider market garden crops to be a better proposition for the Cornish grower than top fruit culture. It has been stated that the fruit trees serve a useful purpose as shelter for the crops grown underneath but there is no evidence to show that any of the vegetable crops are in any way benefited by such shelter—the contrary seems to be true except possibly in the case of rhubarb. The scope that exists in Cornwall for a large extension of the market garden industry—especially as it applies to early production under cold glasshouses—appeals strongly to the casual observer.

In Somerset we found that the conditions in top fruit are much different from those in most of the other districts visited during the judging. Some promising young plantations have been established, where situation and other conditions are suitable, but it is especially in the farm orchards that much progress has been made during the past few years. Of six entries of farm orchards from this county three took first awards and another a second award in their respective classes.

In the case of Mr. Willy's orchard at Langport and that of Mr. Hosegood at Williton—both of which are mainly "Bramley Seedling"—we would suggest that, in view of the heavy bearing capacity that these fine trees will attain in the near future, consideration be soon given to the important question of marketing. The grass orchard is undoubtedly a very sound investment where suitable conditions and management prevail.

It is obvious to the onlooker that the Somerset County Council is carrying out very valuable work and that growers in the county are taking advantage of the advice and knowledge which is available. There is ample evidence to show that on such important matters as varieties, stocks, etc., advice has been given only where such has been proved to be correct. Progress in orchard renovation has gone steadily along on the right lines, and wherever the county's instruction has been adhered to, one can see most gratifying results.

In a brief visit to the experimental fruit plots at the Cannington Court Farm Institute, we were struck by the way, strictly on a commercial basis, in which the trials are conducted. All that we were shown there appeared of immediate informative value. The fruit trees were particularly clean and carrying an excellent crop.

On this subject of County Council plots we consider that, for obvious reasons, such plots should not be accepted as entries

in this competition. In the majority of cases these plots consist of variety trials, manuring, pruning experiments, etc., and cannot be judged satisfactorily in comparison with commercial holdings.

TENANT FARMERS' AGREEMENTS.

We wish to point out the undesirable terms of some Landlord's agreements as affecting farm orchard management. It came to our notice that a tenant farmer was bound by his agreement to maintain the *number* of trees on the area devoted to orcharding, irrespective of distances, soil suitability and other factors. Such conditions are absurd where—as is often the case—the land is already over-stocked with trees. Some reform seems needed in this connection.

CIDER ORCHARDS.

It is to be regretted there were not more entries in this section. Had there been a class for young cider fruit orchards there would no doubt have been a larger entry under this head, for we are pleased to report that several well laid out young cider orchards were observed during the tour.

The increasing shortage of home-grown cider apples—more especially the bittersweet varieties—is becoming a serious handicap to a progressive and important industry, and we would urge upon those who have cider fruit trees under their care to pay more attention to the eradication of pests. We are convinced that better and more regular cropping can be assured by suitable measures of pest control, and we wish to emphasise this point in view of what we saw where spraying had been adequately done.

APPLES—VARIETIES.

The outstanding variety among the apples was undoubtedly "Bramley Seedling," and with proper attention it should prove the most profitable. It was noticeable that even in the somewhat neglected orchards that we visited this variety was outstanding as regards vigour and crop. It seems to grow almost wherever any kind of tree will grow.

BUSH FRUITS.

We were disappointed with the bush fruit entries. With few exceptions insufficient care had been taken with the roguing of the bushes. A severe frost on one particular night throughout the whole area appears to have severely reduced the crop.

STRAWBERRIES.

It is obvious from what we saw that "Royal Sovereign" is the best strawberry variety provided the grower takes the

trouble to maintain a good productive strain. It was regrettable to note the heavy infestation of aphids on all plantations. Apparently growers do not realise that this alone, in very many instances, is the cause of weak plants and inferior cropping capacity.

A nine-days' interval elapsed between the judging of the first and the last of the strawberry entries, and since the period was one of drought, the judges may have unwittingly penalised some of the later plantations.

CONCLUSION.

From the orchards we saw there is no doubt that the standard apple in grass is the natural cultivation for the Western Counties. Growers, however, must pay more attention to pest control. There appears to be a lack of cohesion between the technical staff of the County Councils and the growers.

Until pest and disease control is seriously undertaken the profitable production of apples is impossible. With two exceptions scab control was almost non-existent. Although attempts had been made to combat this very serious disease it was obvious that either the times of applications or the methods of application had been sadly at fault.

In the cultivated orchards canker was very rife—even young trees of from 5–6 years old were already dying of canker. In the grass orchards canker was not such a serious disease.

As previously stated we think it a great pity that more trouble is not taken to obtain a crop of cider fruit. At present, cropping appears to be a "hit or miss" affair.

During our tour we did not see one efficient spraying outfit—without which, of course, efficient pest control is impossible.

Before concluding our report we wish to tender our thanks to the following gentlemen for their kind and valuable assistance during the judging:—

Mr. A. D. Turner ...	...	Horticultural Superintendent, Somerset County Council.
Mr. H. W. Abbiss ...	...	Horticultural Superintendent, Cornwall County Council.
Mr. D. M. Manning	...	Horticultural Superintendent, Devon County Council.
Mr. C. J. Gleed ...	...	Horticultural Superintendent, Hants County Council.
Mr. S. Langman ...	...	Warminster, Wilts.

Our special thanks are also due to Mr. E. C. Boughton for his painstaking and detailed work in connection with the planning of the itinerary and judging arrangements—without which it

would have been impossible for the judges to cover such a large area in the scheduled time.

The inspection of the 54 entries entailed 1,211 miles of road travel.

Judges { W. LAWRENCE TAYLOR.
ALEC. WHITING.

REPORT OF THE COUNCIL TO THE ANNUAL GENERAL MEETING OF GOVERNORS AND MEMBERS OF THE SOCIETY,

HELD AT THE

ROYAL AGRICULTURAL HALL, ISLINGTON, LONDON, N.,

On WEDNESDAY, December 7, 1932, at 2.30 p.m.

Membership.

1. The Council have to report that the list of Governors and Members has undergone the following changes since the Annual General Meeting on December 9, 1931:—10 new Governors (including 3 transferred from the list of Members under Bye-law 9), and 357 new Members have joined the Society, and 3 Members have been re-instated under Bye-law 14; whilst the deaths of 3 Honorary Members, 8 Life Governors, 8 Governors, 80 Life Members, and 193 Members have been reported. 1 Life Governor, 11 Life Members and 26 Members have been struck off the books under Bye-law 12, owing to absence of addresses; 3 Governors and 143 Members under Bye-law 13, for arrears of subscription; 23 Governors and 546 Annual Members have resigned.

2. During the year the Council have suffered the loss of two of their number—Mr. George G. Rea and Mr. H. Dent Brocklehurst.

Mr. Rea represented the Division of Northumberland on the Council for over a quarter of a century. By reason of his knowledge of live stock, he was always a most useful member of the Stock Prizes and Judges Selection Committees; he also served on the Chemical and Showyard Works Committees.

From 1906 to 1930 Mr. Brocklehurst was one of the representatives of Gloucestershire on the Council. At the end of last year he rejoined the Society's governing body as one of the representatives of the division of London. He had served on the Journal and Education, Botanical and Zoological, and Chemical Committees. Of the last-named he was for some time Chairman.

3. Lord FitzWalter, Sir Howard Frank, Sir William Somerville and Dr. R. Stenhouse Williams had all rendered useful service to the Council in the past, although at the time of their decease they were no longer members of it.

4. Amongst other Governors and Members whose loss by death the Society has to deplore are :—The Rev. the Marquis of Normanby, the Earl of Dudley, G.C.B., G.C.M.G., G.C.V.O., Earl Fortescue, K.C.B., the Earl of Kimberley, the Earl of Mar, Viscount Brentford, Lord Forester, Lord Harris, G.C.S.I., G.C.I.E., Lord Merthyr, Field Marshal Lord Methuen, G.C.B., G.C.M.G., G.C.V.O., Lord North, Lord Ravensworth, Lord Stafford, the Right Hon. Sir Horace Plunkett, K.C.V.O., F.R.S., Sir Charles H. Cave, Bart., Sir R. J. Graham, Bart., Sir Herbert Hambling, Bart., Sir Charles V. Knightley, Bart., Colonel Sir John Rutherford, Bart., Lady Rachel Byng, Lady Emily Cathcart, Sir Frederick D. Green, Sir Neville P. Jodrell, Sir William Priestley, Sir Frank W. Wills, Professor B. Bang, Mr. Arthur S. Bowlby, Mr. E. N. Casares, Mr. W. M. Cazalet, Lieut.-Col. R. E. Cecil, D.S.O., Colonel R. F. Dudgeon, C.B., Mr. Hubert J. Greenwood, Mr. A. L. Jessopp, Mr. Frederick Neame, the Rev. H. M. Rowdon, Mr. Leonard G. Sutton, Dr. Herbert Watney, and Mr. Ainslie Watson.

5. By direction of the Council, the Secretary communicated with fourteen Members who had paid their subscriptions for fifty consecutive years, acquainting them with the provisions of Bye-law 4. Ten replied and, of these, seven accepted Life Membership; the remaining three are continuing to pay their subscriptions as usual.

Numbers on Register.

6. These and other changes bring the total number of Governors and Members on the Register to 9,778, divided as follows :—

- 145 Life Governors ;
- 224 Annual Governors ;
- 1,781 Life Members ;
- 7,615 Annual Members ;
- 13 Honorary Members ;

9,778 Total number of Governors and Members, as against a total of 10,456 on the Register at the time of the last Annual Report.

Presidency.

7. The Council have decided to recommend to the Annual General Meeting the election of his Grace the Duke of Devonshire, K.G., as President of the Society to hold office until the Annual Meeting in 1933.

Elections to the Council.

8. Members of Council retiring under the scheme of rotation at the forthcoming Annual Meeting are those representing the electoral districts of Group A, which includes Bedfordshire, Cheshire, Cornwall, Derbyshire, Dorset, Hampshire and Channel Islands, Hertfordshire, Lancashire and the Isle of Man, Middlesex, Monmouthshire, Norfolk, Northamptonshire, Northumberland, Staffordshire, Worcestershire, Yorkshire (North Riding), and Scotland. The Governors and Members registered in each of those districts have been notified, and the customary procedure is being followed for the election or re-election of representatives for the divisions concerned.

Mr. Arthur Hiscock, who has served as the representative of the division of Dorset since 1905, has decided, owing to ill-health, not to seek re-election.

Dates of Council Meetings.

9. The following dates have been fixed by the Council for their meetings in 1933 :—February 1, March 1, April 5, May 3, May 31, July 5 (in Derby showyard), August 2, November 1, December 6.

Accounts.

10. In compliance with the Bye-laws, the Council beg formally to submit the balance-sheet, with Receipts and Payments for the year 1931. These Accounts were published in Vol. 92 of the *Journal* issued to Governors and Members this year, having been certified as correct by the Professional Accountants and Auditors appointed by the Members. Copies of the Accounts will be available for reference at the Meeting on December 7.

War Loan Conversion.

11. The Society's holding of Five Per Cent. War Loan, amounting to £15,294 nominal, has been transferred into the new 3½ Per Cent. War Loan.

Paris Agricultural Machinery Exhibition.

12. In view of representations made by members of the Implement Committee and exhibitors in the Implement and Machinery section at the Royal Show, the Secretary was authorised to visit the Exhibition of the French Agricultural Machinery and Implement Manufacturers in Paris, on the 24th January last.

13. One of the objects of his visit was to observe how the new implements and machines were staged together in a prominent part of the Exhibition Hall, in order that those interested

could obtain details and information regarding such machines as quickly as possible, and without having to trouble to visit the whole of the Exhibition.

14. As a result of this visit the Secretary reported to the Council that no comparison could be made between the Paris Exhibition and the Royal Show.

15. The French Exhibition was divided up into sections and all implements and machinery relating to that particular section were staged together. The new or novel machines were somewhat disappointing in numbers. They were, however, placed upon one Stand, but not in a very prominent position.

16. The Implement Committee instructed the Secretary to send an extract from his Report to the exhibitors in the Machinery section of the Royal Show, and to ask for their observations thereon, but it was generally agreed that, as additional expense would be involved to the exhibitor, no change should be made in the present system of entering and exhibiting new machines at the Royal Show, unless there was a general request made by the exhibitors that this should be undertaken.

Southampton Show.

17. The 91st Annual Exhibition of the Society was held at Stoneham Park, Southampton, from July 5 to 9. It was exceptional in many details. The Corporation of Southampton were unable to issue an invitation to the Society to hold the Show in their Borough, and were not prepared to acquire a site which could be placed at the disposal of the Society. It was, therefore, necessary for the Council to secure a site for a showyard, to level and prepare the same, and to lay on the usual services of gas, water, and electricity.

18. Southampton, in conjunction with the Counties of Hampshire, Dorset, Wiltshire, and West Sussex, did, however, raise a Local Fund amounting to £5,215 towards the expenses involved in staging the Show.

19. Through the good offices of Mr. J. E. Willis Fleming, and his Agent, Mr. Alan Arnold, a portion of the old Remount Depot at Swaythling was taken upon a tenancy, and Mr. G. H. Brown, the tenant, very generously offered to forego his tenancy of such land for the year of the Show.

20. This land, although outside the Borough boundary, was in close proximity thereto, and though actually in the County Council area, when negotiations were concluded, it eventually became part of the Urban District of Eastleigh, owing to a change in boundaries before the opening of the Show.

21. The Southern Railway Company erected a special Unloading Dock at Eastleigh Station, and rendered valuable assistance to the Society and exhibitors in the conveyance of Stock.

22. Notwithstanding the fact that entries of both Implements and Stock were somewhat fewer than at the previous Show, the exhibits in almost all the sections worthily sustained the traditions of the "Royal," and the Exhibitors are to be congratulated upon making such an excellent show.

23. Instead of engaging the Metropolitan Police for service in the Showyard, it was arranged that this duty should be undertaken by the Hampshire County Constabulary, which will result in a considerable saving on this item alone. The work of the Hampshire Police was satisfactory in every respect.

24. The Bournemouth Division of the Young Men's Christian Association undertook the welfare work for the herdsmen. They provided the usual canteens before the opening of the show, and after the closing of the show, and gave concerts each night in the Large Marquee. In conjunction with the British Herdsmen's Club, they also organised Sports on two of the evenings of the show.

25. The Musical Ride and Trick Riding Display given by the Royal Scots Greys again proved a popular feature.

26. Judging on the opening day was carried through under showery conditions, but fine weather prevailed for the greater part of the period.

27. Happily there were no outbreaks of foot and mouth disease in the country for some weeks before and during the Southampton week, so that the show this year was free from restrictions.

28. Their Royal Highnesses the Duke and Duchess of York honoured the Society by visiting the Show on the Wednesday. They arrived about noon and visited the Flower Show, afterwards lunching with the President, Council and members of the Local Committee. In the afternoon they saw the Cattle Parade and Ride of the Scots Greys from the Royal Box and inspected various exhibitors' stands in the Implement Section. Their Royal Highnesses left Swaythling Station for London about 4.30 p.m.

29. The total attendance of paying visitors during the five days was 47,578—the lowest since the show of 1905.

Young Farmers' Cattle Judging.

30. Under the auspices of the National Federation of Young Farmers' Clubs, the annual international cattle judging competition was again decided in the Society's showyard. This year the installation of a microphone and loud-speakers

enabled spectators at the ring-side to hear the reasons given by the competitors for their placing of the animals. England, Northern Ireland and the United States of America were represented, and the Gold Challenge Cup was won by the English team. The presentation of the Cup to the winners was made by Lord Mildmay.

Silver Medals for New Implements.

31. Three silver medals for "new implements" were awarded at the Southampton Show to the undermentioned :

Transplanters (Holding Co.) Ltd., for a Planting Machine

Bamfords, Ltd., for a Diesel Engine

William Aitkenhead, for a Flexible Harrow, with Renewable Tines.

On the recommendation of the Judges, the Tractor Wheel entered by Miller Wheels, Ltd., was deferred for further Tests, and the exhibitors concerned will be allowed to re-enter it for the Derby Show next year.

32. The suggestion of which mention was made in the last Report that in future all new implements entered for competition should be grouped under one roof has received the consideration of the Implement Committee but, in view of the report made by the Secretary on his visit to the Paris Exhibition of Machinery, will not be adopted unless the Exhibitors themselves express a general desire for this to be done.

Conference with Implement and Machinery Manufacturers.

33. In May last, representatives of the Agricultural and Road Machinery Manufacturers' Association met the Implement Committee, when a number of questions in connection with the Society's Show were discussed.

These have received the careful consideration of the Council, and in some instances, such as the issue of invitations to Overseas Agents and Makers to attend the Royal Show, have been acted upon. Other suggestions are still under consideration and reports will be made by the appropriate Committees to the Council in due course.

Woodlands, Plantations and Estate Nurseries.

34. Kent, Surrey and Sussex formed the area of competition this year for woodlands, plantations and estate nurseries, and the entries numbered 48. The Marquis Camden was awarded the Royal English Forestry Society's Gold Medal for the best plantation, and the Silver Gilt Medal (First Prize) in the class for the best managed woodlands on an estate of not less than 1,000 acres was won by Viscount Cowdray.

It has been decided that Derbyshire, Nottinghamshire and Lincolnshire shall form the area of competition for 1933.

Orchards and Fruit Plantations.

35. Restricted to Cornwall, Devon, Somerset, Dorset, Wiltshire, Hampshire and the Isle of Wight, this year's Orchards Competition had 55 entries. The special medal for the entry receiving the highest number of points was awarded to Mr. Edward Pyne, The Gardens, Topsham, Devon.

Next year's competition area will be Kent, Surrey, Sussex and Berkshire.

Awards for Long Service.

36. Medals and Certificates are again offered for long service to farm servants in England and Wales. Claims on behalf of farm workers for consideration in connection with these awards must be made through County Agricultural Societies before the end of the year.

Derby Show, 1933.

37. The ninety-second annual exhibition of the Society will be held next year at Derby, from Tuesday, July 4, to Saturday, July 8.

Prize List.

38. With certain alterations, the Prize List for the 1933 Show will be similar to that for the Southampton Show. Offers of Champion and other prizes have been received from the following:—Shire Horse Society, Clydesdale Horse Society, Suffolk Horse Society, British Percheron Horse Society, Hunters' Improvement and National Light Horse Breeding Society, National Pony Society, Shorthorn Society, Hereford Herd Book Society, Devon Cattle Breeders' Society, Sussex Herd Book Society, Sussex Cattle Breeders' Society of South Africa, Welsh Black Cattle Society, Longhorn Cattle Society, Aberdeen-Angus Cattle Society, English Aberdeen-Angus Cattle Association, Argentine Aberdeen-Angus Association, Dun and Belted Galloway Cattle Breeders' Association, Galloway Cattle Society, Dairy Shorthorn Association, Lincolnshire Red Shorthorn Association, South Devon Herd Book Society, Red Poll Cattle Society, Blue Albion Cattle Society, British Friesian Cattle Society, Ayrshire Cattle Herd Book Society, English Guernsey Cattle Society, English Jersey Cattle Society, British Kerry Cattle Society, Dexter Cattle Society, Oxford Down Sheep Breeders' Association, Shropshire Sheep Breeders' Association, Southdown Sheep Society, Hampshire Down Sheep Breeders' Association, Suffolk Sheep Society, Dorset Down Sheep Breeders' Association, Dorset Horn Sheep Breeders' Association, Wiltshire or Western Horn Sheep Society, Ryeland Flock Book Society, Kerry Hill (Wales) Flock Book Society, Clun Forest Sheep Breeders' Association, Lincoln Long-wool Sheep Breeders' Association, Leicester Sheep Breeders'

Association, Society of Border Leicester Sheep Breeders, Wensleydale Longwool Sheep Breeders' Association, Kent or Romney Marsh Sheep Breeders' Association, Swaledale Sheep Breeders' Association, Welsh Mountain Sheep Flock Book Society, National Pig Breeders' Association, Large Black Pig Society, Gloucestershire Old Spots Pig Society, Cumberland Pig Breeders' Association, Essex Pig Society, National Long White Loped Pig Society, National Welsh Pig Society.

Special Prizes are being offered in the Poultry section by the Croad Langshan Club, Sussex Poultry Club, Columbian Wyandotte Club, Buff Orpington Club, British Barnevelder Club, British Black Barnevelder Club, Welsummer Club, Rhode Island Red Club.

Commercial Pig Classes.

39. At their April meeting, the Council debated a resolution brought forward by Sir Douglas Newton that, with a view to promoting effective competition with imported pig products, the number of breeds of pigs for which the Society offers prizes should be restricted to four. At the conclusion of the discussion, Sir Douglas withdrew his motion on the understanding that the question was carefully considered and that the possibility of establishing commercial classes for baconers and porkers was investigated by the Stock Prizes Committee of the Council.

Having gone into the matter, that Committee were unable to agree to a limitation of breeds, but they recommended—and the Council approved—that the following classes be included in the prize list for the Derby Show :—

Pigs most Suitable for Bacon.

Class 1.—Two pigs of any pure breed above 180 lb. and not exceeding 230 lb. each live weight.

Class 2.—Two pigs, first cross between any pure breeds, as above.

Porkers.

Class 3.—Two pigs of any pure breed above 100 lb. and not exceeding 140 lb. each live weight.

Class 4.—Two pigs, first cross between any pure breeds, as above.

Prizes of £10, £5 and £3 will be offered in each class with the usual extension if there are more than 9 entries. The entry fee will be £1 per entry in each class. The judge will be a trader or connected with a bacon factory, and the animals will be judged on *inspection* only.

Closing of Entries.

40. Intending exhibitors at Derby are reminded that the final date for receiving entries of Live Stock is MAY 10. Entries for Produce close MAY 20, and entries for Poultry on MAY 31.

Applications for space in the Implement, etc. Department must be made not later than March 20.

Future Shows.

41. A cordial invitation from the Ipswich Town Council to hold the Show in Ipswich in 1934 has been accepted by the Council of the Society.

The County Agricultural Societies of Suffolk, Norfolk and Essex are supporting the project, and propose to withhold their annual shows for the year in view of the visit of the National Society.

42. Newcastle-upon-Tyne, as mentioned in last year's Report, will be the venue of the Show in 1935.

43. If satisfactory arrangements can be made, the Show of 1936 will be held in the West of England.

British Judge at Argentine Show.

44. At the request of the Argentine Rural Society, the Council appointed Mr. J. D. Key, of Clifton Mill, Rugby, to judge the exhibits of Shorthorn Cattle at this year's Palermo Show.

Chemical Department.

45. The past 12 months have seen a slight increase in the number of samples sent to the Society's Laboratory, by Members, for analysis, the total being 113 as against 107 in 1931. The monthly reports of the Consulting Chemist have dealt with matters engaging attention at the time; prominent among these have been the continued occurrence of castor-oil bean in feeding materials, and the marked fall in price of Sulphate of Ammonia. Other interesting points have been the action of different waters upon lead and other metals used in pipes, boilers, &c., and the use of different processes for softening hard water.

46. The marked fall of price of Sulphate of Ammonia has occasioned a similar fall in the unit price of nitrogen, necessitating a reconsideration of the Tables of Unexhausted Manurial Value. Phosphatic materials have also undergone a slight decline, while, on the other hand, potash-containing ingredients have become rather dearer.

47. The new regulations connected with the administration of the Fertilisers and Feeding Stuffs Act have received the sanction of Parliament and came into force on September 1.

48. The Chemical Committee has had to record with much regret the death of two of its prominent members, Mr. G. G. Rea and Mr. H. Dent Brocklehurst, the latter of whom was chairman from 1928 to 1930.

Botanical Department.

49. The number of enquiries received in the Botanical Department has shown a slight tendency to increase during

1931-32. Their distribution over the various branches differs somewhat from that of the two previous years. The most noteworthy change is to be found in the fall in the number of those concerned with the formation of grassland. These now appear to have reached the pre-war average. There has been an increase in the numbers connected with seed germination, the choice of varieties, the manuring of grass and arable land, and of plant diseases. In this last section, the diseases of fruit trees still predominate, though more enquiries than usual about the cereal crops have been received.

Zoological Department.

50. The work of the Department during the past year has consisted chiefly in answering enquiries received from Members concerning various pests of plants and farm animals, and in the identification of specimens.

The applications raised few points of special interest, the failure of crops being usually due to quite familiar insects. Pests which appear to have been more than ordinarily prevalent include: apple saw-fly, cabbage root-fly, cabbage gall weevil, pea thrips, and some species of aphids. Remarkably few cases of attack by the various corn flies were reported, and turnip-fly was the subject of very few enquiries, as the weather did not favour severe attacks.

Several animal parasites were the subject of enquiry, and a few insects injurious to forest trees.

Animal Diseases.

51. It is pleasing to find that the published returns for the first nine months of 1932 show a diminution, as compared with the corresponding period of last year, in the notifiable diseases—anthrax, parasitic mange, sheep scab, swine fever and foot and mouth disease. In the period under review there were ten outbreaks of foot and mouth disease. These occurred in Durham in January; Kent in April; Worcestershire in August; and Devon in September.

Further outbreaks were confirmed on October 3 at Combe Martin, North Devon, on October 5 at Mold, Flintshire, and on October 29 at Caistor, Lincolnshire.

Veterinary Department.

52. During the past year Members of the Royal Agricultural Society, resident both in England and abroad, have availed themselves of the privilege of help from the Staff of the Royal Veterinary College in several severe outbreaks of disease. One gentleman residing in India was helped over some difficulties

connected with an outbreak of abortion in a stud of valuable mares. A number of deaths in calves in Hertfordshire were definitely traced to hemlock poisoning, and in several cases of mortality amongst sheep and lambs valuable advice was given in regard to preventive treatment for future outbreaks. Advice was also given on suspected cases of sewage poisoning, and contagious abortion of cattle. A valuable bull was operated upon for tumour trouble.

Suggested Ban on Imported Vegetables.

53. Following on the expression of opinion by the Northern Ireland Government that imported vegetables were the source of an outbreak of foot and mouth disease there, the Directors of the Highland and Agricultural Society of Scotland urged upon the Minister of Agriculture the necessity of prohibiting the importation of vegetables from countries where the disease is known to be prevalent. The Highland Society's representations received the full support of the Council of the Royal Agricultural Society, and a communication on the subject was addressed to the Minister by Lord Mildmay as President.

54. Sir John Gilmour, however, was unable to agree that there was sufficient evidence to justify the issue of an Order prohibiting the importation of foreign vegetables.

Need for Research into Pig Diseases.

55. Attention was called, at the Council meeting in March, to the urgent necessity that existed for scientific study of the diseases affecting the pig. It was understood that the members of the Agricultural Research Council were fully convinced of the need for research into pig diseases, and intended to take up the matter.

Spahlinger Anti-T.B. Bovine Vaccine.

56. Dr. Minett, who has been appointed as Observer for the Society, is keeping in touch with the Ministry of Agriculture for Northern Ireland in connection with the test, now in progress under their auspices, of the Spahlinger Anti-Tuberculosis Bovine Vaccine.

Quarantine Station.

57. During the fourth year's operations, ending March 31 last, the following stock was exported to the Dominions and Colonies named, after passing through the London Quarantine Station :—

	Cattle.	Sheep.	Pigs.	Goats.	Total.
Australia	25	2	3	—	30
New Zealand, via Australia	—	8	—	—	8
Tasmania, via Australia	—	2	—	—	2
Irish Free State	23	13	21	—	57
Palestine	6	—	3	—	9
South Africa	84	26	10	3	123
Southern Rhodesia	2	—	—	—	2
	<u>140</u>	<u>51</u>	<u>37</u>	<u>3</u>	<u>231</u>

58. Comparative figures for the three previous years are as follows :—

Year ending—					
March 31, 1929	347	126	60	10	543
March 31, 1930	387	192	109	5	693
March 31, 1931	204	339	49	4	596

The total number of animals which have passed through the Station for the four years since its opening is :—

<u>1078</u>	<u>708</u>	<u>255</u>	<u>22</u>	<u>2063</u>
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59. The reduction in the number of animals isolated in the Quarantine Station during the last financial year was doubtless attributable to the prevailing depression and to the fact that the Freight Subsidies of some of the Dominions and Colonies had been withdrawn.

60. Administration costs for the four years in question were :—

	£	s.	d.
1928/29	1,010	13	4
1929/30	874	18	1
1930/31	1,465	1	5
1931/32	1,584	12	5
	<u>£4,935</u>	<u>5</u>	<u>3</u>

61. In the seven months of the fifth year commencing April 1, 1932, i.e. between the closing of the last Government financial year and the end of October last, the following stock has been exported through the Quarantine Station :—

58th Period, commencing
April 7—April 21

14 Cattle
3 Pigs

17 South Africa

59th Period, commencing
May 13—May 30

5 Cattle
2 Sheep

7 Australia

60th Period, commencing June 7—June 21	.	4 Sheep	Australia
61st Period, commencing July 6—July 21	.	12 Cattle 1 Goat	
		13	South Africa
62nd Period, commencing August 13—August 27	.	1 Goat	South Africa
63rd Period, commencing Sept. 13—October 5	.	2 Sheep 2 Cattle 2 Sheep	New Zealand, via Australia Southern Rhodesia Antigua
		6	

the steamers sailing respectively on September 27, September 28, and October 5.

64th Period, commencing October 6—October 21	.	3 Cattle 22 Sheep 4 Pigs	29 Cape Town and Durban
—October 28	.	10 Cattle 52 Sheep	62 Algoa Bay
			91

Nineteen head of cattle and 49 sheep, destined for South Africa, enter the Station on November 8, sailing November 22, and 2 pigs, for shipment to Australia on November 28, will enter the Station on the same day.

62. Cattle shipments to Australia can be resumed after the "close" season, which ends on December 1, and a quarantine period, commencing November 29, has been fixed, for which 29 head of cattle have been booked. There are also 3 goats for Trinidad.

63. The administration and general working of the Station continues to run smoothly.

64. During the year the Manager of the Quarantine Station, A. Ritchie, resigned to take up the position of Land Steward to H.M. The King, at the Royal Farms, Windsor, and his son, H. J. Ritchie, was appointed Acting Manager in his place.

65. Advantage was taken of a slack period in the summer months to repaint the Station internally and externally, the work being carried out by the staff.

66. The Annual Report issued by the Empire Marketing Board states :

"The London Quarantine Station continues to facilitate the export of pedigree livestock from this country to overseas Empire countries in spite of the suspension of the 'assisted passages' scheme.

"The net cost per animal quarantined after crediting to the Ministry of Agriculture the veterinary inspection fees due to them was just under £2 8s. 0d.

"The thanks of the Board are due to the Royal Agricultural Society of England for the economical and harmonious administration made possible by their efficient management of the Station."

67. The five years' lease of the Quarantine Station from the Port of London Authority expires on the 28th December, 1932, and with it the termination of the administration of the Station by this Society under the Deed of Appointment from the Empire Marketing Board.

Butter Marking Order.

68. The Marking Order relating to butter under the Merchandise Marks Act—the application for which was made by the Royal Empire Society and strongly supported by the Council—came into operation on June 17. Russian butter sold in a wrapper bearing the words "Finest Empire Produce" was the ground for a successful prosecution in September last.

Research Committee.

69. The last issued volume of the *Journal* gives the usual progress report regarding the work being carried on with the aid of grants from monies voted by the Council for research. Owing to the need for economy the sum placed at the disposal of the Committee has had to be somewhat reduced, with the result that it has not been possible to undertake any new investigations this year.

70. Further work connected with the Inoculation of Lucerne research has been carried on at the Rothamsted Experimental Station, including the testing of new strains of lucerne bacteria. About 3,100 cultures have been distributed by Messrs. Allen & Hanburys, Ltd., this year.

71. The Rothamsted staff engaged in examining and collating the data concerning the Woburn Experiments are approaching the completion of their task, and it is hoped that the first article dealing with the lessons to be learned from this long series of experiments will be ready for publication in the next volume of the *Journal*.

72. In the investigation of Bovine Mastitis at the Animal Pathology Research Institute progress has been made in the study of the bacteriology of the disease and in its diagnosis.

73. There has also been continued during the year the series of trials on the economic use of Sugar Beet Tops at the Norfolk Agricultural Station; and the experiments in Hampshire on the effect of Sheep Folding and other methods of maintaining fertility on light land with particular reference to a corn-growing system.

Agricultural Research Annual.

74. This year the Society's annual survey of agricultural research—the seventh of the series—appears under a new title, *The Farmer's Guide to Agricultural Research*, and, as usual, copies are being issued with the Annual Report to those who have expressed a wish to have it. A new section is included in the present number on *Pests and Parasites*. The other contributions deal with *Dairy Farming and Dairy Work*; *Diseases of Animals—Prevention and Treatment*; *Farm Economics*; *The Feeding of Live Stock*; *Farm Implements and Machinery*; and *Soils and Manures*.

75. The volume is free to Governors and Members who apply for it, and it may be obtained by non-members from the Secretary, or from the Publisher (John Murray, 50A Albemarle Street, W.), 1s. 3d. post free. Copies of earlier volumes are still obtainable.

Medal for Research.

76. A Silver Medal and money or books to the value of £10 were again offered by the Research Committee this year for a monograph or essay giving evidence of original research on the part of the candidate on any agricultural subject, on any of the cognate agricultural sciences, or on agricultural economics. Candidates must reside in Great Britain or Ireland, and must not be more than 30 years of age.

Last year's Medal was awarded to Mr. G. Lorrain Smith, M.A., for his essay entitled "The Migration of Farmers in relation to the Economic Development of Great Britain since 1830."

77. Six essays have been received this year, and, if possible, arrangements will be made for the Medal to be presented to the successful competitor at the Annual Meeting.

The Society's Charter.

78. Arising out of a resolution proposed by Sir Archibald Weigall, the Council requested the Committee of Selection and General Purposes to reconsider the clause of the Society's Royal Charter which at present excludes from its meetings or its proceedings all questions "of a political tendency, or having reference to measures pending, or to be brought forward, in either of our Houses of Parliament."

Sir Archibald attended the Committee's meeting and stated his views, and the Secretary placed before the Committee a letter from the Society's Solicitors setting out the procedure that would have to be adopted in the event of an alteration being decided upon.

79. Having given the most full and careful consideration to the question, the Committee did not consider it advisable

to recommend that any alteration be made in the Charter. The Committee's report was adopted by the Council.

Representation on other Bodies.

80. Colonel Stanyforth, Chairman of the Implement Committee, has been appointed to serve on a Sub-Committee of the Committee for Rural Economy which advises the Director of the Institute of Agricultural Engineering at Oxford, as to the work of the Institute; Mr. Thomas Forshaw has become the Society's representative governor of the Midland Agricultural College, in place of Lord Belper, resigned; and Sir Merrik Burrell undertook to act as the Society's delegate to the Conference on Tuberculosis convened by the Royal Institute of Public Health.

Queen Victoria Gifts.

81. For the present year the Trustees of the Queen Victoria Gifts Fund made a grant of £180, to be devoted to gifts to candidates as below, the distribution in each class to be left until after the election to pensions by the Royal Agricultural Benevolent Institution: six gifts of £10 each to Male Candidates; three gifts of £20 each to Married Couples; six gifts of £10 each to Female Candidates. Including the present grant, a sum of £4,040 has been paid over to the Royal Agricultural Benevolent Institution since 1906.

Ottawa Conference.

82. Early in May the Minister of Agriculture requested the Society to nominate a representative to serve on the Committee set up to assist Sir Douglas Newton, who had been appointed Adviser on Agriculture and who was attending the Imperial Economic Conference.

83. Matters of importance affecting Agriculture would fall for consideration at that Conference, and the Minister desired to have first hand information on Agricultural problems, to enable him to discuss these problems with his Adviser before attending the Conference.

84. A special meeting of the Selection and General Purposes Committee was called for the 11th May, when Sir Arthur Hazlerigg, Bart., was appointed the Society's representative, with Mr. John Evens as his substitute. The Council endorsed the recommendation of the Special Meeting of the Selection Committee, and Sir Arthur Hazlerigg immediately took steps to consult the Breed Societies.

85. Letters were despatched to 61 Societies representing the various breeds of Cattle, Sheep, and Pigs, asking them to express their opinions upon the export and import of Live Stock, and the import of Meat into this country. Replies

were received from most of these Societies. They were tabulated and sent as, and when, received, to Sir Arthur Hazlerigg, who laid them before the meetings of the Advisory Committee which he attended, so that the Society had the benefit, not only of Sir Arthur Hazlerigg's knowledge and experience, but of the views of the Breed Societies in this country.

86. It is, therefore, with interest that the Society now awaits the result of the representations made to the Minister which were discussed at the Ottawa Conference.

Medals for Cattle Pathology.

87. In the annual examination for the Society's prizes held at the Royal Veterinary College, the Silver Medal was won by Mr. G. J. G. Halford, St. Luke's Vicarage, Leek, and the Bronze Medal by Mr. D. T. Michael, 7 Glyncolli Road, Treorchy, Glam. The examination was conducted by the Professors of the College and comprised written and oral work on the diseases of cattle, sheep, and swine.

National Diploma in Agriculture.

88. Forty-three candidates were successful in obtaining the National Diploma in Agriculture at the thirty-third Examination held this year at Leeds from April 14 to 21. See list on pages 354 and 355.

National Diploma in Dairying.

89. The thirty-seventh Annual Examination for the National Diploma in Dairying took place in September at the University and British Dairy Institute, Reading, for English and Welsh students, and at the Dairy School for Scotland, Auchincruive, for Scottish students. Sixty-three candidates were examined at the English centre, of whom thirty-one were awarded the Diploma; and forty-one presented themselves at the Scottish Centre, of whom twenty-one obtained the Diploma. No candidate reached the Honours standard at either Centre. The names of the successful candidates are given on pages 357-359.

By Order of the Council,

T. B. TURNER.

Secretary.

16 Bedford Square,
London, W.C.1.

NATIONAL AGRICULTURAL EXAMINATION BOARD.

Appointed by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland.

REPORT ON THE RESULTS OF THE THIRTY-THIRD EXAMINATION FOR THE NATIONAL DIPLOMA IN AGRICULTURE.

HELD AT LEEDS, APRIL 14 TO 21, 1932.

1. The Thirty-third Examination for the NATIONAL DIPLOMA IN AGRICULTURE was, by the courtesy of the authorities, held at the University of Leeds, from the 14th to the 21st April last.

2. The subjects of Examination were Practical Agriculture (two papers), Farm Machinery and Implements, Land Surveying and Farm Buildings, Agricultural Chemistry, Agricultural Botany, Agricultural Book-keeping, Agricultural Zoology, and Veterinary Science and Hygiene. The whole nine papers could be taken at one time, or a group of any three, four or five in one year and the remaining group at one examination within the next two years. Candidates taking the whole Examination in one year who failed in not more than three subjects, and candidates taking a second group who failed in not more than two subjects, were allowed to appear again for those subjects only next year. Candidates failing in one or two subjects of a first group of not less than four, or in a single subject of a group of three, were permitted to take those subjects again in conjunction with the second group.

All candidates, before sitting for the Practical Agriculture and Farm Machinery and Implements papers, had to produce evidence of possessing a practical knowledge of Agriculture obtained by residence on a farm for a period or periods (not more than two) covering a complete year of farming operations.

3. The Examiners in the different subjects were:

PRACTICAL AGRICULTURE (First Paper, 400 Marks. Second Paper, 400 Marks) J. R. Bond, M.B.E., M.Sc., N.D.A. (Hons.), Prof. J. A. Scott Watson, M.C., M.A., and William Bruce, M.A., B.Sc.; FARM MACHINERY AND IMPLEMENTS (300 Marks) S. J. Wright, M.A.; LAND SURVEYING AND FARM BUILDINGS (100 Marks) Edward Walford, F.S.I.; AGRICULTURAL CHEMISTRY (200 Marks) S. Allison, Woodhead, D.Sc., F.I.C.; AGRICULTURAL BOTANY (200 Marks) Prof. Montagu Drummond, M.A., F.L.S., F.R.S.E.; AGRICULTURAL BOOK-KEEPING (200 Marks) James Wyllie, B.Sc., N.D.A. (Hons.), N.D.D.

AGRICULTURAL ZOOLOGY (100 Marks) Dr. R. Stewart MacDougall, M.A., F.R.S.E.; and VETERINARY SCIENCE AND HYGIENE (200 Marks) O. Charnock Bradley, M.D., D.Sc., M.R.C.V.S.

4. One hundred and sixty-eight candidates presented themselves, as compared with 162 last year. Twelve candidates took the whole Examination, 73 who had previously passed in certain subjects appeared for the remaining portion, and the other 83 candidates came up for a first group of subjects.

5. Forty-three candidates were awarded the Diploma, the first three gaining the Diploma with Honours.

DIPLOMA WITH HONOURS.

- 1st, JOHN HEYWOOD COCK, Seale-Hayne Agricultural College, Newton Abbot, Devon.
- 2nd, GEORGE BARTRAM, Midland Agricultural College, Sutton Bonington, Loughborough.
- 3rd, JOHN DRUMMOND TALLANTIRE, University of Leeds.

DIPLOMA.

- ARTHUR FAIRHURST BLACKBURN, University of Leeds.
 WILLIAM CARR, Armstrong College, Newcastle-upon-Tyne.
 JOHN CARRICK, West of Scotland Agricultural College, Glasgow.
 WILLIAM CHAMBERS, West of Scotland Agricultural College.
 WILLIAM JOSEPH THOMPSON CURTIS, Midland Agricultural College.
 GEOFFREY RONALD BARR DAWSON, University of Leeds.
 WILLIAM ELLISON, Armstrong College.
 WILLIAM JOHN ENGLAND, University of Reading.
 JAMES WILLIAM FELL, Armstrong College.
 FRANCIS GERARD GILLETT, Harper Adams Agricultural College, Newport, Shropshire.
 CHRISTOPHER FRANCIS HODSON GOODE, Seale-Hayne Agricultural College.
 GEORGE ALFRED GREAVES, University of Reading.
 GEORGE HENRY HUGHES, Seale-Hayne Agricultural College.
 MALCOLM JULIUS KINSEY, South-Eastern Agricultural College, Wye, Kent.
 THOMAS WYNDHAM LEWIS, Armstrong College.
 DONALD AUSTIN MCKENZIE, Glasgow University and West of Scotland Agricultural College.
 MARGARET ANNA FAIRMAN MILLER, Edinburgh and East of Scotland College of Agriculture.
 WILLIAM MITCHELL, Junr., West of Scotland Agricultural College.
 ALFRED HERBERT MOORE, South-Eastern Agricultural College.
 LEWIS TREVOR MORRIS, Armstrong College.
 CYRIL GEORGE MORTIMER, University of Leeds.
 STEWART NORTON PARKIN, Seale-Hayne Agricultural College.
 KENNETH MAXWELL PEARMAN, Armstrong College.
 GEOFFREY WILLIAM POPE, Midland Agricultural College.
 GEORGE BARTLETT READ, University of Reading.
 ROBERT RENFREW, West of Scotland Agricultural College.
 CYNFAE ROBERTS, University College, Bangor.
 CYRIL ROWE, University of Reading.
 MICHAEL OWEN ROWLANDS, University College, Bangor.
 JOHN CLIFFORD SAVILLE, Midland Agricultural College.
 ROBERT HENRY SHARP, South-Eastern Agricultural College.
 FRANK SKINNER, Seale-Hayne Agricultural College.
 FRANK HARVEY STANLEY STEPHENSON, Midland Agricultural College.

PHILIP LACE TEARE, West of Scotland Agricultural College.

JOHN THACKER, Harper Adams Agricultural College.

FRANCIS TIZZARD, Seale-Hayne Agricultural College.

ANTHONY THOMAS GEORGE TREW, University of Reading.

EDWARD CHARLES TROTTER, South-Eastern Agricultural College.

THOMAS COX WATERMAN, Seale-Hayne Agricultural College.

WESLEY WRIGHTMAN, Armstrong College.

6. Four of the candidates appearing for the whole Examination failed in not more than three subjects, and 14 of those taking a second group of subjects failed in not more than two. These will be permitted next year to take again the subjects in which they failed.

7. Of the 83 candidates appearing for a first group of subjects, the following 43 succeeded in passing, and will therefore be permitted, subject to the Regulations, to take the second group in 1933 or 1934 :

GEORGE C. ABBOTT, Midland Agricultural College.

JAMES O. ANDREW, South-Eastern Agricultural College.

GEORGE S. BLAIR, University of Leeds.

ROBIN COUSINS, East Anglian Institute of Agriculture, Chelmsford.

THOMAS C. CREYKE, University of Leeds.

JOHN DOWNEY, University College, Aberystwyth.

WILLIAM C. DYER, Seale-Hayne Agricultural College.

GEORGE E. FEARNSIDE, University of Leeds.

FREDERICK H. FOSTER, South-Eastern Agricultural College.

JOHN S. L. FOWLER, Seale-Hayne Agricultural College.

JOHN R. GILKS, Harper Adams Agricultural College.

FRANCIS G. HAINES, East Anglian Institute of Agriculture.

HENRY C. HARE, University of Leeds.

ALLAN L. HEMINGSLEY, Harper Adams Agricultural College.

FRANCIS M. HOLLIS, East Anglian Institute of Agriculture.

PETER HOLMES, Seale-Hayne Agricultural College.

ROBERT HOPE, Armstrong College.

ALBERT E. HOUGHTON, Midland Agricultural College.

JOHN F. HUNTER, West of Scotland Agricultural College.

PETER C. JACK, Junr., Greigston, Cupar, Fife.

JAMES K. LAMBERTON, Glasgow University and West of Scotland Agricultural College.

ALEXANDER McARTHUR, West of Scotland Agricultural College.

HUGH N. MACARTHUR, West of Scotland Agricultural College.

ANDREW A. McINTYRE, West of Scotland Agricultural College.

BETTY A. MAIDMENT, University of Reading.

KENNETHINA MATHESON, Glasgow University and West of Scotland Agricultural College.

THOMAS H. MATTHEWS, Seale-Hayne Agricultural College.

DUDLEY A. T. MAYNARD, Seale-Hayne Agricultural College.

JAMES R. MOFFATT, South-Eastern Agricultural College.

GEORGE C. L. PALMER, University of Reading.

LEONARD PARFITT, Royal Agricultural College, Cirencester.

JAMES PEARLANE, West of Scotland Agricultural College.

THOMAS M. PROSSER, Edinburgh and East of Scotland College of Agriculture.

ALEXANDER M. REED, Harper Adams Agricultural College.

NORMAN S. ROBINSON, Midland Agricultural College.

JAMES P. STREUTERS, Glasgow University and West of Scotland Agricultural College.

DONALD G. SUTHERLAND, West of Scotland Agricultural College.

WILLIAM M. SWINDELLS, Harper Adams Agricultural College.

ALBERT J. THOMPSON, South-Eastern Agricultural College.

ARTHUR T. THWAITES, Seale-Hayne Agricultural College.

JAMES M. TREW, South-Eastern Agricultural College.

HARRY WILKINSON, Armstrong College.

STEPHEN WILLIAMS, University College, Aberystwyth.

8. Twenty-six of the unsuccessful candidates sitting for a first group failed in one or two subjects, which they will be allowed to take again in conjunction with the second group in 1933 or 1934.

9. The thanks of the Board are again due to the authorities of the University of Leeds for their liberality and courtesy in placing the Great Hall and other rooms of the University at the Board's disposal for the Examination; and to the Examiners for the care and attention they bestowed upon the written answers to the papers set and upon the *viva-voce* examination.

C. H. BROCKLEBANK, *Chairman*.

16 Bedford Square, London, W.C.1.

April, 1932.

NATIONAL DAIRY EXAMINATION BOARD.

Appointed by the Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, and the British Dairy Farmers' Association.

REPORT ON THE RESULTS OF THE THIRTY-SEVENTH EXAMINATION FOR THE NATIONAL DIPLOMA IN DAIRYING 1932.

1. The fourth Examination under the auspices of the present Board—and the Thirty-seventh Annual Examination for the National Diploma in Dairying—was by the courtesy of the Authorities held during September at the University and British Dairy Institute, Reading, for English and Welsh students, and at the new Dairy School for Scotland, Auchincruive, Ayr, for Scottish students.

2. As a preliminary to the acceptance of an application for permission to enter for the Examination, a candidate was required to produce:—(1) A certificate testifying that he or she had attended a Diploma Course in the subjects of the Examina-

tion covering *two academic years* at an approved Dairy Training Institution ; (2) Evidence that he or she had spent at least six months on an approved Dairy Farm and taken part in the work.

A candidate who had already taken a Degree in Agriculture of a British University or a Diploma in Agriculture recognised by the Board, could enter for the Examination after one year's subsequent training at an approved Dairy Training Institution, providing that such course included at least six months' training in practical dairy work, and that he or she had worked for at least six months on an approved Dairy Farm.

3. Under this year's regulations, a candidate who, having passed in the practical examination, failed in not more than *three* subjects of the written examination might, at the discretion of the Board, appear for those subjects in the following year. A candidate who failed in four or more subjects of the written examination, or in any part of the practical examination, failed in the whole examination.

4. The written Examination included papers on Dairy Farming, Dairy Hygiene, Principles of Dairying, Dairy Factory Management and Dairy Engineering, Chemistry and Physics, Dairy Bacteriology, and Dairy Book-keeping. The Practical Examination comprised Hard-pressed, Blue-veined, and Soft Cheese-making, and Butter-making.

5. At both Centres the same Questions were answered by the candidates from September 8 to 10. The Practical Examination as well as the *vivâ voce* was conducted at the English Centre from September 12 to 16 and at the Scottish Centre from September 20 to 24.

6. Of the 63 candidates who presented themselves at the English Centre nine appeared for re-examination in subjects in which they had previously failed. Thirty-one candidates were successful in passing, but no candidate attained to the Honours standard. The names of the Diploma winners are in alphabetical order :—

ENGLISH CENTRE.

Diploma.

GLADYS ELLEN AUDREY, The University and British Dairy Institute, Reading.

LILY AMY ELLEN BAKER, The University and British Dairy Institute, Reading.

HYLDA AUGUSTA BURR, The University and British Dairy Institute, Reading.

WALTER CHARLES NICKERSON CHURCHYARD, University College, Aberystwyth.

JOHN HEYWOOD COOK, Seale-Hayne Agricultural College, Newton Abbot, Devon.

ELIZABETH ELEANOR MYFANWY DAVIES, University College, Aberystwyth.

HARRIET EDWARDS, University College, Aberystwyth.

EVELYN NONA ELLIS, Studley College, Warwickshire.

WILLIAM JOHN ENGLAND, The University and British Dairy Institute, Reading.

ANNIE MARY EVANS, The University and British Dairy Institute, Reading.

OLIVIA GATHERAL, Studley College, Warwickshire.

ELIZABETH HEYES HESKETH, Lancashire County Council Dairy School, Hutton, Preston.

E. KATHLEEN HOLDING, Midland Agricultural College, Sutton Bonington, Loughborough.

SAMUEL LEONARD HUTHNANCE, The University and British Dairy Institute, Reading.

NANCY HUTTON, Lancashire County Council Dairy School, Hutton, Preston.

JOYCE EMILY JEFFERY, Midland Agricultural College, Sutton Bonington, Loughborough.

CATHERINE ENIDWEN JONES, University College, Aberystwyth.

JENNIE RUTH JONES, University College, Aberystwyth.

MARGARET HILDA JONES, The University and British Dairy Institute, Reading.

ARTHUR WILSON LAUNDER, The University and British Dairy Institute, Reading.

ANNE ROSAMUND JULIA MEDLEY, The University and British Dairy Institute, Reading.

ELIZABETH MARGARET PARKER, East Anglian Institute of Agriculture, Chelmsford.

MARGARET JOAN PING, The University and British Dairy Institute, Reading.

DONALD EDWIN RALPH, University College, Aberystwyth.

GEORGE BARTLETT READ, The University and British Dairy Institute, Reading.

JANET MURIEL RITCHIE, Studley College, Warwickshire.

EDWARD FRANK ROBERTS, The University and British Dairy Institute, Reading.

WILLIAM PARK STRANG, The University and British Dairy Institute, Reading.

MAUD WEIGHELL, Lancashire County Council Dairy School, Hutton, Preston.

ARTHUR JOHN WHITLOCK, Seale-Hayne Agricultural College, Newton Abbot, Devon.

WINIFRED MARY WILDSMITH, Midland Agricultural College, Sutton Bonington, Loughborough.

Eighteen candidates failed in not more than three subjects, for which they will be allowed to reappear at next year's Examination.

7. Forty-one candidates presented themselves at the Scottish Centre, of whom sixteen were re-examined in subjects in which they had failed on a former occasion. The twenty-one candidates whose names are given below in alphabetical order succeeded in passing the examination, but no candidate attained to the Honours standard :—

SCOTTISH CENTRE.

Diploma.

FLORENCE ESTHER CORKILL, Ballamenagh Farm, Baldrine, Isle of Man.

HENRY HIRST, Heatherdene, Newby, Scarborough.

ALEXANDER ROBERT AINSLIE HURSTON, Ploverhall, Evie, Kirkwall, Orkney.

AGNES SCOTT MCINTYRE, Badyen Farm, Cardross, Dumbartonshire.
DONALD AUSTIN MCKENZIE, 42 Wellshot Drive, Cambuslang, Glasgow.
MARGARET ANNA PAIRMAN MILLER, 13 St. Catherine's Place, Edinburgh.
CATHERINE MITCHELL, Bleaton, Blairgowrie.
JANET HENDERSON MITCHELL, Castleton, Fordoun, Kincardineshire.
CYRIL GEORGE MORTIMER, Daffil Cottages, Churwell, Leeds.
ELIZABETH M. MURCHIE, Shannachie House, by Whiting Bay, Arran.
MARJORY WILSON ORD, 2 Mayberry Grove, Linthorpe, Middlesbrough, Yorks.
STEWART NORTON PARKIN, 5 Belmont Road, St. Peter Port, Guernsey.
JAMES STEEL PATERSON, Hayhill Farm, Gartcosh, Lanarkshire.
CATHERINE STEWART RATTRAY, Drummonie, Dalginross, Comrie, Perthshire.
ROBERT RENFREW, Blackstoun Cottage, Paisley.
MARY ANDERSON SCOTT, 38 Cadden Place, Aberdeen.
ROBERT BARR SILLAR, Low Todhill, Kilmarnock.
EVA SHENNAN SMITH, Wyllieland, Fenwick, Ayrshire.
KATHLEEN MARGARET LINDSAY SPENCE, Commieston, Montrose.
JOHN WEIR, Fairview House, Hollandbush, Hamilton.
MILDRED MARY WRIGHT, Greenbank, Temple Sowerby, Penrith.

Nine candidates failed in not more than three subjects for which they will be permitted to reappear in 1933.

8. The Examiners at both Centres were : R. H. EVANS, B.Sc. (*Dairy Farming, Dairy Hygiene, and Practical Butter-making*) ; WILLIAM LAWSON, M.B.E., N.D.A. (Hons.), C.D.A. (Glas.), N.D.D. (*Principles of Dairying, Dairy Factory Management and Dairy Engineering and Practical Cheese-making*) ; T. J. DRAKELEY, D.Sc., Ph.D., F.I.C., (*Chemistry and Physics*) ; A. T. R. MATTICK, B.Sc., Ph.D. (*Dairy Bacteriology*) ; H. W. KERSEY (*Dairy Book-keeping*).

F. J. CARRUTHERS, *Chairman.*

T. B. TURNER, *Secretary.*

16 Bedford Square, London, W.C.1.
September, 1932.

ANNUAL REPORT FOR 1932 OF THE PRINCIPAL OF THE ROYAL VETERINARY COLLEGE.

THE satisfactory progress in 1931 in the control of diseases in farm stock has been more than maintained in 1932. In the case of *Foot-and-Mouth Disease* there was a notable decrease in the number of outbreaks compared to last year, only 25 outbreaks being confirmed against 97 in 1931. The use of the protective serum for animals in the immediate vicinity of an

outbreak is being continued by the Ministry, but the Department regard the value of serum as not yet definitely established and are using the product experimentally.

The country has remained free of *Glanders* and *Rabies* and, in fact, no case of glanders has occurred in Great Britain since 1928. It must here be stated that cases of the disease have been reported in human beings, the last in 1931.

Rabies was eradicated in 1922 and with continued vigilance by the officers of the Ministry of Agriculture and Fisheries in carrying out the quarantine regulations we may rely on continued immunity from this scourge.

It has to be noted with regret that the progress made in the eradication of *Bovine Tuberculosis* is disappointing. It is to be feared that little progress can be expected until there is a material alteration in the administration of the Milk and Dairies Act and the Tuberculosis Order.

In the case of *Anthrax* the figures are very encouraging, only 344 outbreaks having been confirmed as against 465 in 1931.

Swine Fever again shows a diminution in the number of outbreaks confirmed by the Ministry of Agriculture and Fisheries and the position is much better than in 1931 and 1930. As a matter of fact the steady decline in the number of confirmed outbreaks, which set in in 1929, has continued each year since.

The position with regard to *Sheep Scab* was much as in 1931, i.e., about 50 per cent. less than in 1929.

Parasitic Mange in the horse again seems to have been less prevalent, a steady decrease in the number of outbreaks being reported each year.

Strongyle Worm Infection in Horses. This troublesome infection of the horse's digestive tract has been again the cause for much microscopical investigation into the excreta; if the proportion of ova or parasites is preventing the host from becoming of good outward appearance, veterinary advice should at once be sought, as the longer the treatment is delayed the more "hold" will these parasites obtain and the more injury is likely to be done to the system, anaemia and such like troubles ensuing. Medicinal stomach lavage is the treatment usually prescribed. It is interesting to note that the strongyle variety has recently been found by Mr. J. S. Steward, M.R.C.V.S., in the diseased tendon tissues of the withers of farm colts, the ensuing condition being similar to that usually known as a "fistulous" wither.

Poultry Diseases. In view of the fact that poultry is at present one of the few branches of farming that "pays its way," it may not be out of place in this report to touch lightly on one or two fowl diseases. Probably the most serious disease with which poultry keepers have to deal is the dreaded B.W.D., i.e.,

bacillary white diarrhoea, or more properly "pullorum disease." The cause of this disease is a germ (*Salmonella pullorum*) which is passed on from hen to chick through the egg. The usual manifestation of the presence of the trouble on a farm is to find several chicks dead each morning from the fourth or fifth day after hatching. No treatment of affected chicks is of any avail and the only prudent course to adopt is to kill and burn all survivors of an affected hatch. Should such survivors be allowed to live they will become "pullorum carriers" and perpetuate the trouble on the farm. It should be pointed out that not every egg laid by a hen or a pullet affected with this disease harbours the germ, but the disease is very contagious among young chicks, a common mortality rate being 80 to 90 per cent. during the first 10 days after hatching. A method of control is available, as by means of an agglutination test of a bird's blood the presence or absence of infection can be ascertained. Sittings of eggs should not be purchased unless the vendor can produce a certificate that his birds have been tested and have passed this agglutination test.

Avian Tuberculosis. This disease is far more prevalent in this country than is generally supposed, and is met with more commonly in flocks belonging to general farmers than in those of poultry farmers. In the case of the latter frequent handling and a stricter observance of individual birds leads to a prompt "weeding out" of all unthrifty and non-laying birds. The presence of this disease among the poultry of a general farmer is a source of danger where pigs are also kept, for it has been stated that at least 30 per cent. of the cases of tuberculosis among pigs is of avian origin. It has also been blamed for cases of tuberculosis in bovines, although the avian type in cattle is of rare occurrence.

In the case of fowls the commonest seat of tuberculous lesions is the liver. The spleen is also frequently affected, together with the intestines, but the lungs more rarely. The distribution of the lesions of tuberculosis in fowls is explained by the method of infection. In the case of human beings and bovines the method of infection is commonly by inhalation of air contaminated with tubercle bacilli. In the case of fowls, and to a lesser extent pigs, the usual method of infection is by ingestion, i.e., taking in of material contaminated with tubercle bacilli.

One of the points in connection with avian tuberculosis to which attention should be drawn is of importance in any attempt to get rid of the disease, that is not to assume a hen or a pullet to be healthy because it is not thin or emaciated. Contrary to the general belief at least 10 per cent. of the birds that die from tuberculosis are in good condition and occasionally

actually fat. The explanation of this may lie partly in the fact that laying hens receive a double ration, *viz.*, maintenance ration *plus* ration to allow for egg production. It will thus be seen that such a bird *not* in lay may be able to counteract the wastage of the disease.

Once tuberculosis has been diagnosed in a flock an owner has at his disposal three methods of eliminating the disease. He may carry on, keeping a strict watch and removing immediately any ailing bird; or if the number is few he can kill the birds and burn their carcasses. Should the number be considerable he can have them tested with tuberculin, and sacrifice those which react to the test. Although, in the case of poultry, the tuberculin test is not so reliable as in the case of cattle, it is a valuable aid in diagnosis, and is extensively used in the United States in tuberculosis eradication work among poultry.

Fowl Pox. This highly contagious disease is responsible for very considerable losses to the poultry industry. A few years ago the disease was investigated at the Veterinary Laboratory of the Ministry of Agriculture at Weybridge, and a method of vaccination was devised which has been found to give very satisfactory results in the field. The vaccine is supplied by the Ministry of Agriculture at a very cheap rate, and an indication of the appreciation of its value by flockowners is the demand for this product, which is understood to be on a scale exceeding half a million doses annually.

The following paragraphs and tables represent the position of this country regarding the Scheduled Contagious Diseases.

PARASITIC MANGE OF THE HORSE.

The year's statistics show 127 outbreaks, with 204 animals attacked, as against 138 outbreaks, with 237 animals attacked in 1931.

FOOT-AND-MOUTH DISEASE.

As stated above, the incidence of Foot-and-Mouth Disease showed a great decrease as compared with the previous year. The following monthly table of outbreaks in Great Britain and other countries shows plainly our favourable position in regard to the prevalence of this disease. It again emphasises the value, not only to the stockowner but also to the British taxpayer, of a well-organised Veterinary Department working hand in hand with the other branches of the Ministry of Agriculture; and the Press would do great service if it would on occasion emphasise this fact rather than expend effort in writing alarming (and often very exaggerated) articles, under headlines which often

display the most appalling ignorance of the rudiments of cattle diseases in general and of Foot-and-Mouth in particular.

Month.	Great Britain.	France.	Germany.	Holland.	Belgium.
January	1	552	3,224	298	50
February	—	511	2,828	341	57
March	—	368	2,107	269	72
April	2	111	988	129	65
May	—	77	1,266	216	33
June	—	156	1,183	441	120
July	—	812	1,838	747	738
August	3	1,681	2,144	1,481	1,439
September	4	1,728	1,610	3,129	1,067
October	2	1,206	978	2,656	256
November	4	1,125	448	879	97
December	8	633	128	279	55

TUBERCULOSIS.

The following table gives the number of animals slaughtered under the Tuberculosis Order of 1925.

Year.	Animals slaughtered.
1928	16,759
1929	15,532
1930	15,363
1931	18,003
1932	19,040 ¹

¹ Approximate figure.

SHEEP SCAB.

The following table shows approximately the number of officially confirmed outbreaks.

Year.	Number of outbreaks.
1928	744
1929	666
1930	478
1931	347
1932	360

SWINE FEVER.

The figures in connection with this disease are again favourable.

Year.	Number of outbreaks.
1928	1,472
1929	2,981
1930	2,408
1931	2,026
1932	1,555

ANTHRAX.

Year.	Outbreaks.	Number of animals attacked.
1928	536	618
1929	439	529
1930	392	446
1931	465	516
1932	344	418

This again shows a favourable downward trend with one of the diseases against which agriculturists have always to be on their guard.

As in previous years the Members of the Royal Agricultural Society have consulted the Staff of the Royal Veterinary College in cases of doubtful and difficult illnesses amongst their stock. The remarks which were made in the Report for 1931 regarding the urgent need to the farmer and breeder for more financial support to veterinary research apply even more to-day than they did last year. It is more than ever necessary for the Nation to husband its resources, and in these resources the health of the animals and the prevention of disease amongst them plays a most important rôle. It is in the latter sphere that the great future of our stock lies, and the veterinary surgeon of the next decade will be less and less a "practising" practitioner. His advice will be mainly sought as a hygienist, to advise on questions of health and comfort and on the means not only of eradicating disease but of *preventing* its return.

With the exception of Foot-and-Mouth Disease, the initial visces of which is so elusive, no disease of late years, either in horses, cattle or dogs, after once being stamped out, has returned to Great Britain; and for this reason the public has

much reason to feel grateful to the Veterinary Advisors of the Ministry of Agriculture and to those who carry out so conscientiously and effectually their rules and regulations.

FREDERICK T. G. HOBDAY.

Royal Veterinary College,
Camden Town,
London, N.W.1.

ANNUAL REPORT FOR 1932 OF THE CONSULTING CHEMIST.

DURING the year 136 samples, or a few in excess of the number (110) for the previous year, were sent by members to the Society's Laboratory for analysis. In addition, 20 samples of cider were analysed in connection with the Society's Show at Southampton.

This is, of course, on the face of it, an extraordinarily small number to come from a Society having a membership of nearly 10,000. But it has to be remembered that great changes have taken place in the last quarter of a century in regard to agricultural education, the development of agricultural colleges and institutions, and legislation affecting the sale of agricultural commodities. The effect of these changes has been to obviate the need for the class of work for which the laboratory of the Royal Agricultural Society was originally designed. The routine work formerly done for members has entirely disappeared, being now undertaken, when required, by agricultural colleges or through the facilities provided by County Councils in connection with the administration of the Fertilisers and Feeding Stuffs Act. The fact is that such readily available and inexpensive facilities now exist for the examination of the foods and fertilisers which the farmer uses, as to remove the need that formerly existed of reference to a central authority such as the R.A.S.E. Laboratory. Moreover, so adequate are the legislative safeguards now provided for the agriculturist who uses ordinary care in his purchases, that there no longer exists the necessity for him to safeguard himself by obtaining, in the ordinary course, an analysis of what he buys; thus routine testing, as such, has, to all intents, disappeared.

So it has come about that the Society's laboratory has been resorted to only in exceptional cases. Consequently my report again has to concern itself with special cases which have occurred during the year rather than to provide any general review of farming and trading relations, the use of feeding stuffs, fertilisers, etc.

This notwithstanding, it will be seen, I think, that the Society's laboratory has its uses, and that when matters involving any real difficulty arise, members are still glad to avail themselves of its help, and its status as an "authority" continues to be fully recognised.

Turning to the matter of supply and demand, it cannot be said that the year has shown any particular change as regards the materials available; little or nothing of a fresh nature has been introduced, and only the extended use of sulphate of ammonia and of concentrated compound fertilisers (referred to in last year's report) has to be chronicled.

In the matter of prices there have, however, been marked changes in the case of certain nitrogenous materials, these having their origin in the cheapening of sulphate of ammonia made by the synthetic process. The reduced price of sulphate of ammonia, whether the result of competition or due to other causes, has brought about an extended use of this material and also a somewhat corresponding fall in the price of other nitrogenous fertilisers more or less similar in their use. The price of sulphate of ammonia a year ago was £7 a ton; in June, 1932, it suddenly fell to £5 15s. a ton, and later to £5 5s. per ton, but it had risen again by the end of the year to £6 2s. Nitrate of soda, starting at £9 per ton, saw successive changes to £8 8s., at which figure it remains, while cyanamide has had more or less to follow the decline of price in order to keep pace with its rivals, and is quoted at £7 per ton. These alterations, however, have not had the effect of materially reducing the price of nitrogen so far as other, and mainly organic, sources of supply are concerned. Still, the general effect has been to bring down the unit price of nitrogen somewhat, and in setting out, as I have been again asked to do by the Central Association of Agricultural Valuers, the Tables of Compensation for the Unexhausted Manurial Values of Purchased Foods, I have found myself called upon to take this fact into account. Along with this has gone a slight fall in the prices of phosphatic materials, while, on the other hand, those of potash salts generally (for the supply of which we are dependent on foreign sources entirely) has undergone some rise.

The joint effect of these changes has been to cause me to put forward somewhat lowered totals in the Tables of Unexhausted Manurial Values—the new figures, per unit per ton, being as follows: for Nitrogen, 10s.; for Phosphoric Acid, 3s.; for Potash, 4s. 6d., in place of the former ones of 11s., 3s. 6d., and 4s. respectively.

While sulphate of ammonia has been much more used than in the previous year, the deliveries of nitrate of soda have been less; cyanamide continues to be in favour on account of

the special properties which it would seem to possess. For nitro-chalk—especially where land requires liming—there would seem to be a fair demand also.

Superphosphate has been used in about the normal quantity, but basic slag has suffered some decline. Potash salts have found an extended use, mainly for fruit, vegetables and market-garden produce.

There is little change to record in the supply, use or price of feeding stuffs as a whole. Bombay cotton cake, however, is but seldom heard of now, and palmnut cake and meal are evidently not used to the extent that was the case some years back.

Maize products, on the other hand, are much more employed, as are also fish-meal, meat-meal, and meat-and-bone-meal, for feeding purposes. Alfalfa (lucerne) meal is now on the market and has been added to the list of foods comprised under the Feeding Stuffs Act.

There has been little to find fault with as regards deficiency of quality of feeding stuffs. Now and then instances have occurred of the presence of castor-oil bean in cakes coming from foreign countries, but here, too, greater vigilance seems to have been exercised, no doubt because of the now universally accepted belief as to the great risk run by feeding with materials that contain this poisonous seed.

I have in previous reports emphasised this, as also the variable nature of its occurrence and the impossibility of stating the extent to which it may exist. I need only repeat the advice I gave to purchasers to insist on the total exclusion of castor-oil bean from feeding materials. If importers likewise were to insist on this and similar provisos we should soon, I feel sure, be able to keep out all harmful and objectionable materials; but so long as London merchants are ready to allow the presence of castor up to a certain percentage, while Liverpool merchants rightly insist on total exclusion, I do not see what can be done.

An important event has been the presentation of the Third Report of the Advisory Committee on the Fertilisers and Feeding Stuffs Act and the issue, consequent on this, of certain new regulations which, having received the sanction of Parliament, came into force on September 1st, 1932.

The passing of these into law, and with comparatively little delay, is a proof of the value of the provision in the Act that there be an Advisory Committee who shall have power to consider, as they arise, any changes that may be desirable, and who can, from time to time, suggest such alterations of the regulations as the circumstances of the time call for. If such a provision existed in the case of several other Acts of Parliament that

might be named—*e.g.*, the Food and Drugs (Adulteration) Act—it would have the effect of removing, at comparatively short notice, many of the difficulties that have arisen through changes of time, manufacture, and trade practice.

The principal amendments notified in the Third Report of the Advisory Committee are :—

In the case of Fertilisers—provision for lime mixtures.

” ” ” ” Feeding Stuffs—new definitions for barley-meal; new regulations regarding the composition of feeding meat-meal, feeding bone-meal, and feeding meat-and-bone-meal; new definitions of bean-meal and pea-meal.

In addition to this are other regulations more of an explanatory nature—such as the proviso that the guarantee shall state the exact quantity of an ingredient contained, and not be given as a range of percentage variation.

The Committee considered other suggestions, such as the compulsory giving of the “citric solubility” in the case of basic slag; though impressed with the growing desire for this, they felt that further experience and experimental evidence were first required, though they introduced into the regulations details of the method of determining “citric solubility.”

As a member of the Advisory Committee, I may express my general concurrence with the terms of the report and the alterations made in the regulations, and can testify again to the value of having a Standing Committee of this kind. At the same time, I may be allowed to indicate two respects in which I found myself at variance with the majority of the Committee. These relate to the new definitions for barley-meal and for bean- and pea-meal. As to barley-meal I consider it a mistake to allow a material which may contain foreign matter to the extent of 10 per cent. to have the term “barley-meal” applied to it at all, whether qualified by the expression “Grade II” or anything else. Farmers know perfectly well what barley-meal is, and what it can be when it is made from such barley as they grow on their own land. This should be the standard for barley-meal (just as it is for wheat-meal, ground oats, bean-meal, pea-meal and other home produce that is used in the ground state) and not a standard fixed by any kind of barley grown in foreign lands, often under very bad cultivation and with little regard to cleanliness. Moreover, under present circumstances, to lay down a limit of 4 per cent. or 10 per cent., of foreign ingredients or impurities is to set a precise standard for something that cannot be accurately determined. Before barley is ground it is easy enough to separate the barley from its impurities and fix a standard of quality or grade, but when the grain has been ground into meal it is, as yet, im-

possible to determine accurately the amount of foreign matter. Under the old system it was left practically to the agricultural analyst to say what standard, according to his experience, could be attained by grinding barley that had been reasonably well-grown and threshed and, under the old definition, the quality of barley-meal, as purchasable by the farmer, improved markedly. Now, by the introduction of a Grade II, the door is opened to the inclusion, under the term "barley-meal," of foreign barleys of very doubtful purity but which no analyst will take the risk of condemning. An immediate consequence of the change was seen in the issue, by a large Cattle Food Trade Association in the West of England, of a circular advising their members to sell *all* barley-meal as Grade II. This surrender to the pressure of the trade interests of importers of foreign barley will, I feel sure, have a bad effect upon the purity of barley-meal generally. Under the old regulations there was a steady improvement in its quality, one much strengthened by the successful issue arrived at in the well-known Uxbridge case, after which I had seldom or never cause to complain of inferiority. But now that anything having up to 10 per cent. of foreign matter will pass as "barley-meal," I look for a retrograde rather than a forward movement as regards the purity of barley-meal.

The other main objection that I took was to the limitation of the use of the terms bean-meal and pea-meal to grain that comes under certain botanical descriptions such as *Vicia Faba*, *Phaesolus vulgaris* (beans), or *Pisum sativum* and *Pisum arvense* (peas), and excluding all leguminous seeds that could not be described as coming under these botanical descriptions.

Here again, as in the case of barley, it may be possible for a botanist or even an analyst of experience to say whether a seed, bean or pea, belongs to this or that species; when the seed has been ground into meal, I defy anyone, whether botanist or chemist, to say to what botanical species it belonged, or whether it was a single variety or a mixture of several. To myself it seemed quite futile to impose conditions to which no scientific man could ever certify; here again, as with barley-meal, I was overruled, and the "ideal" took the place of the "practical."

Yet another reason for my objection lay in the fact that the limitations implied in the definitions would have the effect of preventing the application of the term "bean-meal" or "pea-meal" to a large number of leguminous seeds which are generally known as beans or peas but which, while they may be perfectly good and useful feeding materials for stock, would not comply with the botanical definitions set out in the regulations. There are many such coming from India, Burma,

China, Java and elsewhere which provide useful and cheap forms of nitrogenous food and their exclusion is, I consider, a mistake. The well-known gram of India (*Cicer arietinum*) may be given as one instance in point, also *Cajanus indicus* (pigeon pea), *Dolichos lablab*, and other grains not now classed by the Act as providing either bean- or pea-meal. I might further point out that the regulation nominally obliges the analyst, if he finds leguminous seeds in compound cakes or meals, to say to what species they belong, and this, as I have pointed out, is a practical impossibility.

The object of the new definition was, no doubt, good and intended to secure the exclusion of certain foreign kinds of beans and peas known to possess harmful properties; but this end is already secured by the provisions of the 5th Schedule and the attempt to define more clearly and more scientifically ends in setting problems impossible for the analyst to solve.

With the above exceptions I would say, generally, that I consider the new regulations to constitute distinct improvements. Time must, of course, be allowed to test their working but the existence of a Standing Advisory Committee gives an assurance that matters will be dealt with as the occasion arises, and without the delay necessarily attaching to the amendment of an Act of Parliament.

Having dealt with matters of general interest, I pass on to consider points brought out primarily in my correspondence with members of the Society in regard to samples submitted by them.

A. FEEDING STUFFS.

1. *Linseed Cake.*

With but few exceptions this class of cake has been found to be pure and up to quality. In one instance only have I come across the presence of castor-oil bean in linseed cake. At once, on feeding with a delivery of this, a number of cattle at a farm in Berkshire were taken ill and the consignment was promptly returned to the vendor, no further particulars about it being procurable.

In another instance I found linseed cake to contain rather much rape seed, along with which was some wild mustard, imparting to the cake a pungent taste; this may constitute a source of damage or even loss.

The price of linseed cake has varied only from £8 7s. 6d. early in the year to £7 15s. per ton later on.

2. *Cotton Cake.*

This has been found to be almost invariably good, and only now and again have I had to draw attention to the occur-

rence of the use of seed not well freed from cotton wool. Bombay cotton cake does not seem to come forward now and one also hears but little of decorticated cotton cake and meal except for use in compound cakes and meals. The ordinary, or undecorticated, cotton cake however seems to be much in favour alike by graziers and for dairy cattle. Its price has been low and more or less steady, ranging only from £5 7s. 6d. to £4 15s. per ton.

3. *Earth-nut (Ground-nut) Cake.*

For this there has been a good demand, the price figuring at £7 to £7 5s. per ton. As with linseed cake, there is an "expeller" make of earth-nut cake, and the presence of castor-oil bean in this requires to be guarded against.

In one case, submitted to me by a member who had purchased ground-nut cake, I found the consignment, while consisting mainly of good ground-nut cake, to contain also some bags of another class of cake resembling it much in appearance, but composed of some other seed, the origin and exact nature of which I have not yet been able to ascertain. This cake possessed a distinctly bitter taste and had been rejected by stock; hence the sample was submitted to me. The vendors took the consignment back, but endeavours to get from the importers exact information as to the country of origin failed. The microscopical examination of the material showed it to be quite different from ground-nut cake, and the oil from it also exhibited quite different characteristics. This cake gave 10.69 per cent. of oil as against the 7.29 per cent. of the ground-nut cake.

4. *Soya Bean Cake and Meal.*

For these there appears to have been a fair demand, more particularly for the extracted meal which is used extensively for dairy cattle. Both cake and meal have been found generally quite good, the prices approximating closely—£8 7s. 6d. to £7 15s. per ton for the cake and from 5s. to 10s. a ton less for the extracted meal.

5. *Coconut Cake, Palmnut Cake and Meals.*

These appear to be less continuously used than previously and it is only occasionally that I come across samples. In particular the use of palmnut meal for pigs seems to have gone out and, as I think, rightly, as I never considered it, because of its fibre contents, a suitable food for an animal that does not digest fibre well.

6. *Compound Cakes and Meals.*

It is in this class of foods, which is largely on the increase, that the more varied use of articles such as those just enumerated is met with; and it may be said to the credit of the manufacturers of these cakes, etc., that, in all but a few instances, the products have proved satisfactory, sound and up to guarantee. It is now but seldom that compound cakes and meals are made the medium for disposing of inferior and waste materials. For this the Fertilisers and Feeding Stuffs Act is, no doubt, in large measure responsible. But, beyond this, there is no question that much more attention is given nowadays to the use of "balanced rations," alike by feeders and manufacturers, and the former find it a great convenience to get, in the form of a mixed cake or meal, a variety of ingredients which it would be difficult for them to obtain in small quantities at satisfactory prices. If, as is undoubtedly the case now, there are good and reliable manufacturers of such compound goods, the purchaser is wise in making use of them so long as prices are reasonable.

Exceptions will, of course, occur, as instanced in the following cases. One was that of a contract for compound cake of certain quality and composition, but where two lots sent were found to be distinctly different one from another, as the subsequent analyses (A and B) show.

	A. No. 1.	B. No. 2.	C.
Moisture	10.28	9.88	12.10
Oil	5.89	7.21	6.74
*Albuminoids	22.50	20.37	22.12
Carbohydrates, etc.	47.66	45.36	38.86
Woody Fibre	6.22	8.34	13.32
†Mineral Matter	7.45	8.84	6.86
	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00
*Containing Nitrogen	3.60	3.26	3.54
†Including Sand and Silica . . . . .	.33	1.00	1.20

The analyses A and B will be seen to differ to a considerable extent and it was evident, on microscopical examination, that No. 2 contained much more cotton and rice, and less maize, than did No. 1.

C concerned the purchase of a "Feed Cake" at the price of £9 5s. per ton, the analysis of which is given above. Microscopical examination proved the cake to be composed, in by far the greatest part, of cotton cake to which had been added a little earth-nut cake, locust-bean meal, and beans. Considering that the price of cotton cake was then £5 7s. 6d. per ton, the price charged for this cake was clearly excessive.

7. *Maize, Rice and other Cereals.*

These call for but little comment, the quality and condition having been found generally satisfactory. In one instance, however, I found that, along with the maize grain, there had been incorporated a certain amount of the cob. The effect of this was to raise the percentage of fibre—which in maize-meal is about 1·7 per cent.—to the figure of 2·95 per cent.

8. *Barley-meal, Ground Oats, Bean and Pea-Meal.*

Barley-, bean- and pea-meals have been referred to earlier. Of ground oats, and Sussex ground oats in particular, it need only be remarked that the samples examined by me have, in each case, been satisfactory. Though I have heard of adulteration of Sussex ground oats with barley, I cannot say that I have met with this in my own experience for some time past.

B. FERTILISERS.

Of fertilisers generally little need be said beyond what has already appeared in the early pages of this report. Reference has been made to the marked lowering of the price of sulphate of ammonia and consequent cheapening, to some extent, of other nitrogenous salts.

The prices of superphosphate and basic slag have remained much as they were, but bones and mineral phosphates generally have met with a certain decline of price. On the other hand, potash salts have become somewhat dearer all round. These changes have, as stated, induced the alterations of values which I have suggested in the Tables of Unexhausted Manurial Values with which my name is associated, and which are issued by the Central Association of Agricultural Valuers.

It will suffice under this section to say that I have had no instance, in the case of fertilisers comprised under the Fertilisers Act, of failure to come up to the guarantees stated for them.

1. *Lime.*

Several samples of lime (burnt), carbonate of lime, etc., have been examined. The following is an instance of inferiority in lime bought as best Buxton burnt lime at 39s. per ton delivered.

The purchaser found great difficulty in sowing the lime in a manure drill, and complained of the damage it had done to his drill through, he believed, the presence of lumps of unburnt and gritty matter.

On examining a sample, I found the farmer's complaint warranted, for the material had lumps of unburnt limestone

in it amounting to 25.73 per cent. of the whole. It is only fair to the vendors to say that they sent over a representative to look into the matter and, on the suppliers of the lime ascertaining that the fault was due to a breaking down of the grinding machinery, they made good the difference in value and also paid for the repair of the drill.

2. Poultry Manure.

A good deal of attention has been directed of late to the value of poultry manure and to methods of drying and preparing it for use and for transport by rail, etc. I have published from time to time in my annual reports, analyses of samples sent me (see this *Journal*, 1921, p. 262; 1923, p. 354; 1928, p. 304), and the product of drying this material either naturally by exposure to air or artificially by heat. The upshot has been to show that the composition and value of poultry manure vary very greatly according to its state of moisture, the period it has been kept, the food given to the birds, and especially the amount of earthy matter, sand, straw or other litter with which it has been mixed. It is consequently impossible to set out any average analysis of it. Moreover, it would not appear that any system of artificial drying and subsequent grinding would "pay" unless carried out on a large scale. Air-drying—even exposure to air—while reducing the water content, will result in a certain loss of ammonia, a loss increased when artificial heating is resorted to. It may pay to do this in the case of large poultry farms and where special care can be taken in the collection and dispatch of the manure, but my belief is that the ordinary smallholder cannot do better than collect the manure and store it under cover to dry naturally.

The following are analyses of samples recently sent me :—

	A. Undried.	B. Dried.	C.
Moisture	21.43	10.86	38.37
*Organic Matter and Salts of			
Ammonia	52.68	63.61	34.89
Phosphoric Acid	4.73	4.86	3.59
Lime	4.70	5.04	3.04
Magnesia, Alkalies, etc. .	6.42	5.29	5.63
Sand	10.04	10.34	14.48
	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00
*Containing :			
Nitrogen	3.09	3.21	2.21
Equal to Ammonia . . .	3.76	3.90	2.69
Ammoniacal Nitrogen . .	.83	.60	
Equal to Ammonia . . .	1.00	.73	

A and B were both good samples, with comparatively little extraneous matter. It will be noticed, however, that the drying (which had been done artificially with hot air), while reducing the water, did not materially increase the nitrogen; also that some ammonia had been lost in the drying:

C was a sample of a purchase made at the price of 46s. per ton, and it may be considered worth quite this.

C. MISCELLANEOUS.

1. Weed Killer.

A sample of powder, sold as a "Weed Killer," and costing £40 per ton, was sent to me by a member. On analysing it, I found it to be little else than sulphate of ammonia, the then price of which was £6 15s. per ton delivered. It contained neither arsenic, lead, copper, nor iron, but was artificially coloured red. It contained: 20.36 per cent. nitrogen, which, reckoned as sulphate of ammonia, would be equivalent to 96 per cent. of that salt. It is obvious that quite as much good could have been effected by using sulphate of ammonia, and at one-sixth of the cost.

2. Soils.

(a) Soils deficient in Lime.

The following are instances—from Lancashire—of soils poor in lime:—

	A.	B.
(Soil dried at 100°C.)		
Organic matter and loss on heating	8.45	9.33
Oxide of Iron and Alumina	7.83	7.50
Lime . . . . .	.16	.23
Alkalies, etc. . . . .	.89	.25
Insoluble Siliceous Matter	82.67	82.69
	<hr/> 100.00	<hr/> 100.00

(b) Soil of exceptionally Rich Nature.

It is not often that one has to complain of a soil being "too rich" but this would seem to me to have been the cause of a complaint that reached me in reference to the strong growth of weeds, more particularly buttercup, on a strip of meadow land which it was the practice to put as hay. The soil came from near Ilkley (Yorks.), and was of black peaty

character with much root fibre. The herbage was very strong and weedy. Analysis of the soil gave :—

(Soil dried at 100°C.)	
Organic Matter and loss on heating	18.88
Oxide of Iron	3.23
Alumina	5.67
Lime . . . . .	.53
Magnesia . . . . .	.13
Potash . . . . .	.29
Soda . . . . .	.18
Phosphoric Acid . . . . .	.53
Sulphuric Acid . . . . .	.33
Insoluble Silicates and Sand	70.23
	<hr/>
	100.00
	<hr/>
Nitrogen . . . . .	.65

It will be noticed that, besides having an unusually large amount of vegetable (organic) matter, the soil was exceptionally rich in nitrogen and also in phosphoric acid. It had been recently limed, which may partly account for lime not appearing deficient. I could not, however, but think that further application of lime would be desirable in view of the vegetable matter present, and also that this and the high nitrogen had induced a rankness and coarseness of growth which had affected grass and weeds alike. In such cases, besides applying lime, I would consider it advisable to cut the grass early so as to check weeds and give the finer grasses a better chance. Also, I would advise keeping the herbage well fed down and not always mown.

Subsequently to making these suggestions, I ascertained that farmyard manure had been used each year on the pasture; this, in the case of a soil already so rich in vegetable matter and nitrogen, is about the last thing I would recommend.

3. *Water.*

In my last report I referred to processes for the softening of hard waters, and this year I have had a number of enquiries concerning the action of waters on pipes of different metallic natures.

Action of Water on Galvanised Iron Pipes.

In a case brought to my notice and occurring in Devonshire, the local authorities had been compelled to adopt a system of hardening the naturally soft water with lime, so as to avoid the risk of lead-poisoning. A sample of the treated water that had passed through lead pipes was found to be without action on that metal.

In the case of a sample from the same district, but from a different source (and not hardened with lime), the water had been passed through a considerable length of galvanised iron pipes. This water I found to be very soft, having only 5.88 grains per gallon of solid constituents; it contained, however, a considerable amount of zinc dissolved in it, this having come, doubtless, from the galvanised iron pipes. Though the harm likely to arise from the presence of zinc in drinking water is not as great as that from lead similarly dissolved, it is not to be regarded as negligible. Galvanised iron is very liable to be attacked by soft waters and pipes made of it should not be used. Water of this kind is, for cold water supplies, best conveyed in iron pipes coated inside with tar or one of the many preparations employed for the purpose of preventing the action of water on iron. Where, as for hot water boilers etc., iron so coated cannot be used, it is best to substitute copper.

A similar instance to the above was brought to my notice from Cornwall, where zinc had been removed to such an extent as to form a regular deposit (oxide and carbonate of zinc). In this case the water contained 14.56 grains per gallon of total solids, but it had over 6 grains per gallon of chlorides reckoned as chloride of sodium.

The retirement of Mr. H. Dent Brocklehurst from the Chairmanship of the Chemical Committee was mentioned in last year's report, and now his death in August has to be chronicled with much regret.

Until his death early in December, 1931, Mr. G. G. Rea had for several years been an active member of the committee. His wide practical experience in the North, coupled with his chairmanship of the Cockle Park Experimental Station of the Northumberland County Council, rendered his services particularly valuable, and his loss is deeply regretted.

The following is a list of the samples analysed on behalf of members of the Society during the 12 months December 1st, 1931, to November 30th, 1932:—

Linseed Cake	2
Cotton Cake and Meal	4
Compound Cakes and Meals	23
Coconut Meal	1
Palm Kernel Cake	1
Ground-nut Cake	2
Cereals, offals, etc.	5
Silage	1

	BROUGHT FORWARD	39
Basic Slag		6
Superphosphate		2
Compound Manures		13
North African Phosphate		2
Raw and Steamed Bones		1
Sulphate of Ammonia		3
Potash Materials		2
Shoddy		3
Lime, Chalk, etc.		1
Milk, Butter, etc.		1
Water		23
Soil		24
Miscellaneous		16
		<hr/>
		136
		<hr/>

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ANNUAL REPORT FOR 1932 OF THE BOTANIST.

A COMPARISON of the enquiries received in the Botanical Department during 1932 with those of the previous year shows only one striking difference. This is a marked diminution in the number of those concerned with the formation of temporary or permanent grassland. In this respect the position is now much as it was before the movement began to lay land down and grassland enquiries are concerned, for the most part, with questions of management. Pathological enquiries continue to increase in number and more attention than usual has been paid to the diseases of the cereal crops. The diseases of fruit trees, however, still take a prominent place in the work of the department.

In the course of the year 220 enquiries were dealt with as against 215 in 1931 and 186 in 1930.

SEED PROBLEMS.

The number of seed samples tested was again about the normal of late years, that is 40. As far as is known they were all home-grown and members sending them expressed doubts as to their suitability for seed purposes. One of the few of any general interest was a sample of barley which on testing was found to germinate less than 40 per cent. As it would have been classed on its appearance as a good sample, an

enquiry about its history was made when the report on its germination was sent out. This brought the information that the grain had been artificially dried. Probably the technique was at fault, for the careful kiln drying of barley has no injurious effect on its germinating capacity and may even, according to some writers, lead to an improvement in this respect. The samples of red clover seed were again characterised by the presence of far too great a percentage of weed seeds. Where no further steps could be taken to purify them, the advice was given that the crops should be sold to seed merchants and a fresh supply of seed purchased in order to avoid a further fouling of the land.

Some of the correspondence on crop failures was directly concerned with the germination of the seed sown. Where seed has been purchased with a guaranteed germinating capacity of, say, 98 per cent., it is perhaps only natural to assume that, when sown, it will produce a perfect plant. But the fact has to be stressed that, whilst the germination tests show almost infallibly what percentage of seeds are capable of growing, they give little indication of the percentage which will produce plants under field conditions. When sown in the open, the mortality is greater than is generally recognised. In this connection some results recently published by the Danish State Seed Testing Station are of interest. Outdoor sowings of some 1,300 samples of high germinating capacity of perennial ryegrass, red clover, swedes, turnips, and brome grass were made under "natural and favourable germination conditions." The samples of swedes, turnips and grasses which germinated in the laboratory from 95 to 98 per cent. produced from 70 to 80 per cent. of plants, the actual figure depending largely on small differences in soil conditions. The clover samples produced from 50 to 60 per cent. of plants.

One's general experience leads to the conclusion that these are over-average results, and it is certain that a far smaller percentage of seeds would produce plants when sown under slightly less favourable conditions. The facts, however, do not imply that a knowledge of the germinating capacity of seeds is of little or no value, for the higher it is the better the chances of a high survival rate.

In addition to cases of crop failure traceable to bad conditions for germination a number of cases of the gradual disappearance of the wheat crop were reported early in the year. The first case examined was a puzzling one, for the plants sent with the enquiry had every appearance of being thoroughly healthy, and a microscopic examination, followed by an attempt to secure cultures of any organism which might be present, failed to show any results. Water-logging was

suspected as the cause, but the position in the field of the disappearing patches ruled this out. A second sample of the plants was obtained. Then, as many of the specimens showed the characteristically frayed leaves which mark an attack by slugs, the diagnosis was simple. Various methods for the control of these pests are of value under garden conditions, but on the field scale the use of poisonous baits, such as Paris green mixed with bran, has not been uniformly successful. On the whole, an early application of a hundredweight of sulphate of ammonia appears to be more useful as a method for saving the crop. The use of copper sulphate and kainit, as mentioned in the Zoologist's report, has sometimes been successful.

WEEDS.

With the steadily increasing foulness of much of the arable land it was only to be expected that weed enquiries would be numerous. Whilst they have shown an increase in number, it has not been a pronounced one. Most of the specimens sent in for identification have been annuals, probably simply because the perennial weeds are well known to most people. Their identification has been an easy matter, but to provide information on cheap and efficacious methods of suppressing them has often been impossible. More thorough cultivation, particularly when such weeds are at an early stage of growth, is still, in the majority of cases, the one way of dealing with them effectively. Spraying with solutions of copper sulphate or of sulphate of ammonia, whilst destroying some species, leaves others more or less unharmed. Dilute sulphuric acid has been recommended in place of these well-tried weedicides, but it is an unpleasant material to handle, and more experimental work is required before it can be recommended to the farmer.

The grassland weeds were chiefly species which are prevalent in old pastures, such as rest-harrow, ragwort, yellow rattle, eyebright, carnation grass and rushes. The list from both arable and grassland, for once, contained no uncommon plants nor any of unusual interest.

PLANT DISEASES.

During the last four seasons the diseases of fruit trees have constituted the largest part of the pathological enquiries, mainly on account of the prevalence of scab in both apples and pears. It appeared that this would again be the case this year. But as harvest approached the diseases of cereals, especially of wheat, came into unusual prominence, with the result that these, with 45 enquiries, easily headed the list.

Nevertheless, the attacks of fungi responsible for plant diseases were not exceptionally severe. A number of outbreaks of the stripe disease in oats and to a less extent in barley were reported in the spring, but in only one case was the damage severe enough to make it advisable to plough the crop under. In the others the percentage of infection was small enough to justify the hope that a reasonable crop would be secured. The disease known as "whiteheads" (*Ophiobolus*), though not uncommon, was not generally severe, and the attacks of rust were not of over-average intensity except where unduly heavy dressings of sulphate of ammonia had been made use of. The diseases characterised by obvious symptoms in the ripening or mature ears were for the most part of minor importance. The commonest was the dark-coloured mould *Cladosporium*. This often develops on ears already destroyed by *Ophiobolus*, but it is not uncommon on plants which appear otherwise to be healthy. It does little damage. Another, sent in on three occasions, was characterised by the development of deep brown patches on the straw immediately below the ear. The tissues of the discoloured areas, however, show no signs of the presence of fungi or bacteria, and for the time no explanation of their origin can be given. The shrivelling of a sample of wheat was assignable to a severe attack of yellow rust, and the discoloration of another to bad harvest conditions providing an opportunity for the growth of mould.

Of the diseases of cruciferous crops finger and toe or club-root was the most important. The more interesting specimens reported on were heavily infected plants of cauliflower and Brussels sprout. With such crops a considerable measure of control can be obtained by watering in when transplanting with a dilute solution of corrosive sublimate, though whether this tedious operation is worth while on the field scale is doubtful.

The unidentified disease of strawberries referred to in the two previous reports does not seem to have been so troublesome this season. No specimens were sent in to the Botanical Department and a bed of infected plants kept for observation purposes was distinctly more vigorous than previously. On the other hand the crop was attacked exceptionally severely by the mould *Botrytis* about halfway through the picking season. One member reported that two pickings only had been secured, the remaining fruit being completely destroyed.

FUNGICIDES.

Information was required on several occasions with regard to the preparation of Bordeaux mixture and of Burgundy mixture.

and of their relative values in the control of potato blight. There is little to choose between them as fungicides, but the latter can often be prepared more readily as washing soda is generally more easily obtainable than the freshly-burnt lime required for Bordeaux mixture. The dry, powdered form of Bordeaux mixture, used in the form of a dust, has the advantage that a supply can be kept on hand, but it is questionable whether it controls the blight as effectively as a well-prepared spray.

Various enquiries were made about the comparatively new fungicide "ceresan." It has been thoroughly tried out at experimental stations, and it has established itself as an excellent material for the control of a number of seed-borne diseases. Chief amongst these are the stripe diseases of oats and barley, bunt and some of the cereal smuts. It will probably replace more or less completely the old blue vitriol and formalin steeps, which, though efficient, had the drawback that they were troublesome to make use of. Ceresan is a finely divided, dust-like powder which can be mixed, at the rate of two ounces to the bushel, with the seed grain any time before it is required for drilling. Its use consequently does away with the necessity for drying the seed grain after steeping. The mixing requires a certain amount of care, for the material, an organic compound of mercury, is poisonous, and the inhalation of even small quantities of the dust may have serious effects. Special dust-proof machines for the purpose have now been placed on the market. Failing one of these, the seed grain and an appropriate quantity of ceresan can be placed in an old churn and a thorough distribution secured by turning it for a few minutes.

In some trials made this season complete control over bunt in wheat and almost complete control over stripe in oats was obtained. About half a pound of wheat was heavily infected by shaking it in a tin with a number of bunt balls. Then a pinch of ceresan was added to the deeply discoloured grain and the shaking repeated. The small plot of wheat raised from it was bunt-free. The oats treated were a commercial sample of Victory, known from germination trials—which usually reveal the presence of the stripe-causing fungus—to be infected. A plot sown with untreated seed contained about 30 per cent. of infected plants, whilst one sown with ceresan-dressed seed only contained 2 per cent.

Ceresan, which is a German preparation, is now made in this country. A somewhat similar English preparation known as "agrosan" is now being placed on the market, but another season must pass before its properties can be closely investigated.

GRASSLAND.

For the first time for some years the enquiries concerning grassland problems have shown a definite falling off in numbers. Two samples of seed for the establishment of temporary grass were examined in order to determine whether they conformed with the specifications, but there were no other enquiries about seed mixtures. Apart from the weeds referred to in another section of the report a few grass species, chiefly bottom grasses, were identified. Most of the correspondence was concerned with the use of artificial manures on fields, sown a few years previously, which were showing signs of running off. Without inspecting such fields it is generally difficult to decide whether their useful life can be prolonged by a dressing of a phosphatic manure or whether it would be better to plough out and reseed with a temporary grassland mixture.

R. H. BIFFEN.

School of Agriculture,
Cambridge.

ANNUAL REPORT FOR 1932 OF THE
ZOOLOGIST.

INTRODUCTION.

FROM the point of view of the Entomologist the year has been uneventful. The work of the department has chiefly consisted in answering questions and giving advice with regard to well-known pests and in the identification of various specimens of insects and Arachnids—either animal parasites or creatures suspected of being responsible for injury to crops.

As is always the case, the incidence of the annually recurring pests was governed by the weather, which favoured some but had an adverse influence on others. Thus little was heard of such pests as turnip-fly and *Sitona* weevils, which flourish in a dry spring, and the usual corn-fly attacks were much below the average, while slugs throughout the spring and every kind of aphid in the summer flourished abundantly. A short review of the year's work is given in the following notes.

CEREALS.

Corn crops appear to have been remarkably free from attacks by the usual corn-flies during the past year. A few slight cases of frit-fly on oats were reported, but it was much

less prevalent than usual. Gout-fly on barley occurred sporadically, but usually not to a serious extent, while only a single case of wheat bulb-fly was brought to my notice. This was a late attack and only affected the tillers, the main shoots having apparently made good growth before the fly appeared.

As usual, many corn crops suffered from wireworm and leather-jacket, but as far as my observation went, slugs did more damage in young cereal crops than any of the recognised cereal pests. Several cases of failure of young wheat crops due to these pests occurred in various parts of the country, though it was usually difficult to persuade the farmer that they could be responsible for such serious damage. It is worth noting that a Norfolk farmer obtained very good control by dressing his wheat crops in spring with kainit and copper sulphate. There was an unusual number of cases of attack by cockchafer grubs on various crops during 1932, and some of these were on wheat crops. The occurrence of "corn cockles"—due to the eelworm *Anguillulina (Tylenchus) tritici*—would appear to be on the increase to a serious extent in some districts, and instances were noted in which a considerable percentage of wheat ears were affected. The hard blackened grains are full of the eelworm, and seed containing them should be rejected.

FARM CROPS.

All the attacks notified in this section were by well-known pests and presented few points of interest. Here again slugs were very destructive on a wide variety of crops. Especially prominent among injurious insects were root-fly and gall weevil on brassicas, aphid on beans, and thrips on peas. Throughout the spring the weather conditions did not favour the pests which are often so destructive in dry spells, and few complaints were received of attacks by turnip-fly or Sitona weevils. Attacks on germinating sugar beet by millipedes and pigmy beetles were rather prevalent. Onion-fly and carrot-fly were notified as being particularly destructive in some districts, but celery-fly attack was apparently below the normal. Cases came under my notice where this fly, usually very troublesome, was almost absent, but where the fungoid disease, celery leaf-spot, was much on the increase.

Potato eelworm. On potato crops the eelworm (*Heterodera schachtii*) continues to do great harm and to baffle all attempts to control it. It is one of a group of eelworms in which the female is not eel-like but flask-shaped, and in its final stage it emerges from the rootlets, and, still loosely attached to them, becomes nothing but a bag of eggs. These "cysts" as they are called easily brush off and are found in the soil, and each

contains three or four hundred eggs which presently develop into eelworms, male and female, ready to attack new plants. Samples of soil from any of the large potato-growing districts yield these cysts in abundance. They are very tenacious of life, and starving them out by rotation would seem impracticable, as years would have to elapse before potatoes could safely be planted again on infested soil. Chemical treatment of the soil has not been successful, and though yield has been increased by the application of farmyard manure, this has had no effect in lessening the infestation, but rather the reverse. Potato plants are found to exude into the soil substances which assist the development of the eggs. The exudations from the roots of some other crops are believed to have the contrary effect, and Dr. Margerie Triffit is experimenting in this direction and has already obtained some interesting results.

Mr. Petherbridge, at Cambridge, made this year an observation which appears to be of some interest to gardeners and allotment holders. He found that samples of seed potatoes were nearly always accompanied by a certain number of living cysts of the eelworm. In view of what has been said of its universal presence in potato-growing districts this would seem to be unimportant, but it has to be remembered that many other crops are liable to attack. Indeed, when some sixty years ago Kühn made the first serious investigation of the life-history of *H. schachtii* it was not regarded as a potato pest, but as the cause of a very fatal disease of beet. Mangold, cabbage, garden cress and especially peas are subject to attack by this pest—as are also hops. It is clear, then, that an allotment so far free from the eelworm might be very seriously injured by its introduction, and it is suggested that an allotment holder would do well to take precautions. All that is necessary is to wash the seed potatoes before planting them. The cysts are loose in the small amount of soil adhering to the tubers and come away very readily, when they may be found floating on the surface of the water.

FRUIT.

The pests of fruit trees and bushes enquired about and observed were, as usual, very numerous, but presented few points of special interest. Among the apple pests, which included aphid, winter moth, apple-blossom weevil, apple sucker, Capsid bugs and saw-fly, the last-named insect was especially destructive in some districts.

A rather unusual number of attacks on strawberry crops were reported. These included strawberry moth, aphid, cockchafer grubs, leather jackets, and in one case the caterpillars

of the Emperor moth (*Saturnia carpi*). This caterpillar is known to include strawberries among the wide variety of plants on which it feeds, but I had not before met with it as a serious pest of that crop.

Raspberry beetle. The fruit pest most frequently enquired about was the raspberry and loganberry beetle (*Byturus tomentosus*). This insect has recently been the subject of very thorough investigation and experiment—especially by Mr. Steer, of East Malling, who has obtained very good control of it by the use of a derris wash. Earlier methods of control were directed chiefly towards the destruction of the beetle when feeding on and ovipositing in the flowers. It was observed that the young grubs spent some time on the exterior of the developing fruit before boring in, and it was found to be especially vulnerable at this stage. Two sprayings with a derris preparation (containing soap) are recommended—one about ten days after the beginning of flowering and the second about ten days later. The dates will vary from year to year and in different districts, but will ordinarily be about June 13th and June 23rd.

I am still of opinion that certain old measures of treatment for this pest might usefully be continued. Jarring the plants over tarred trays at the time of flowering catches large numbers of the beetles before they have had time to do harm, and it is a very simple operation. Then the possibility of lessening the number of beetles emerging next spring by some treatment of the soil after gathering the fruit need not be lost sight of. In experiments recorded in these Reports several years ago I found that the grubs which dropped fully fed from the fruit remained for some time an inch or two beneath the surface before turning to pupae and to beetles, and suggested that hoeing, or the application of some insecticide to the soil, immediately after fruit gathering was likely to diminish future attack.

The beetle is known to infest wild raspberries as well as cultivated varieties of similar berries, and infection from wild plants in the hedgerows is always possible. That the reverse process sometimes takes place was shown in a case from East Anglia, where the beetle was very destructive in a fruit garden, while the wild plants were entirely free except in the immediate vicinity.

ANIMAL PARASITES.

Replies were sent to questions concerning various parasites of domestic animals, including warble-fly and the lung-worm, nostril-fly and "maggot" of the sheep. Some water snails from a pond in a meadow where liver fluke was feared proved

not to be *Limnæa truncatula*, the intermediate host of that worm, but an allied species.

Various ticks and other parasites were sent for identification, mostly from overseas.

FOREST AND TIMBER PESTS.

Very few enquiries were received concerning injuries to growing trees. The only cases of any importance notified were *Chermes cooleyi* on Douglas fir, osier midge and poplar longicorn. Several timber-destroying insects were sent for identification, including the large "death watch" beetle (*Xestobium tessellatum*), a *Callidium* beetle, and a somewhat rare species, the large oak longicorn (*Cerambyx miles*), but the country of origin of the plank containing it was not certainly known.

MISCELLANEOUS NOTES.

Every year complaints are received of the depredations of chafer grubs, and usually at least three species of chafer are concerned. This year the cockchafer grub was the culprit in all the cases referred to me, and the variety of crops attacked is worthy of note. These included potatoes, mangolds, wheat and strawberries. Almost any root serves their turn, but the food of the mature beetle is the leaves of trees, especially oak, and it often happens that farm crops in the neighbourhood of oak woods are particularly subject to injury by the grubs.

A number of samples of infested grain and foodstuffs were sent with requests for information about the insects present. No fewer than ten different creatures were found in one sample or another, and a list of them may possess some interest. Two enquiries concerned the "bacon beetle" (*Dermestes lardarius*), and in one of these cases infested dog biscuits had been deprived of all their meat constituent, while the cereal part was untouched, so that nothing wrong was noted till they had been rejected by the dog and broken open for investigation. Grain samples yielded both of the common weevils (*Calandra granaria* and *C. oryzae*), and also the so-called "biscuit weevil," which is not a true weevil but a relative of the "death watch" beetle. Three other beetles which occurred were *Silvanus surinamensis*, *Ptinus fur* and a much rarer species, *Anthicus floralis*. The last insect has occasionally been recorded as present in grain, but little is known of its habits and no injury has been traced to it. It may perhaps feed on other insects in the grain and be actually useful. The list further included two species of Tyroglyphid mites, and lastly a sample of barley from California was found to be badly infested by the grain moth

(*Sitotroga cerealella*). This species, unlike the European grain moth (*Tinea granella*), only thrives in a fairly warm climate, so that though it is often brought into the country in foreign grain it seldom establishes itself to any serious extent in English granaries.

CECIL WARBURTON.

School of Agriculture,
Cambridge.

Royal Agricultural Society of England.

(Established May 9th, 1838, as the ENGLISH AGRICULTURAL SOCIETY, and incorporated by Royal Charter on March 26th, 1840)

Patron.

HIS MOST GRACIOUS MAJESTY THE KING.

President for 1933.

THE DUKE OF DEVONSHIRE, K.G.

Year when
first elected
on Council

Trustees.

1919	H.R.H. THE PRINCE OF WALES, K.G., <i>York House, S.W.1.</i>
1922	H.R.H. THE DUKE OF YORK, K.G., <i>145 Piccadilly, W.1.</i>
1930	H.R.H. THE DUKE OF GLOUCESTER, K.G., <i>Buckingham Palace, S.W.1.</i>
1905	ADEANE, CHARLES, C.B., <i>Babraham Hall, Cambridge.</i>
1895	BEDFORD, Duke of, K.G., <i>Woburn Abbey, Bedfordshire.</i>
1893	CORNWALLIS, Lord, <i>Linton Park, Maidstone, Kent.</i>
1887	CRUTCHLEY, PERCY, <i>Sunninghill Lodge, Ascot, Berkshire.</i>
1904	DARESBUY, Lord, C.V.O., <i>Walton Hall, Warrington.</i>
1898	DEVONSHIRE, Duke of, K.G., <i>Chatsworth, Bakewell, Derbyshire.</i>
1910	HARLEIGH, Lord, C.B., <i>Brogynryn, Oswestry, Shropshire.</i>
1909	HAZLERIGG, Sir ARTHUR, Bart., <i>Noseley Hall, Leicestershire.</i>
1891	STANYFORTH, Lt.-Col. E. W., C.B., <i>Kirk Hammerton Hall, York.</i>

Vice-Presidents.

1922	BROCKLEBANK, Rev. C. H., <i>Westwood Park, West Bergholt, Essex.</i>
1921	BURRELL, Sir MERIK R., Bart., <i>Floodgates, West Grinstead, Horsham.</i>
1908	DERBY, Earl of, K.G., <i>Knowsley, Prescott, Lancashire.</i>
1924	DESBOROUGH, Lord, K.G., <i>Taplow Court, Maidenhead.</i>
1900	GRAVES, R. M., <i>Wern, Portmadoc, North Wales.</i>
1929	HAREWOOD, Earl of, K.G., <i>Harewood House, Leeds.</i>
1903	HARRISON, WILLIAM, <i>Albion Iron Works, Leigh, Lancashire.</i>
1922	MILDMAY OF FLETE, Lord, <i>Flete, Ermington S.O., Devon.</i>
1915	PORTLAND, Duke of, K.G., <i>Welbeck Abbey, Worksop, Notts.</i>
1914	POWIS, Earl of, <i>Powis Castle, Welshpool, Mont.</i>
1928	TREDEGAR, Viscount, C.B.E., <i>Tredegar Park, Newport, Mon.</i>
1907	YARBOROUGH, Earl of, <i>Brocklesby Park, Habrough, Lincolnshire.</i>

Ordinary Members of the Council.

1922	ALEXANDER, HUBERT, <i>The Croft, Sully, near Cardiff (Glamorgan).</i>
1931	BARCLAY, F. F., <i>Brent Pelham Hall, Buntingford (Hertfordshire).</i>
1911	BEHRENS, Major OLIVE, <i>Swinton Grange, Malton (Yorks, N. Riding).</i>
1932	BEIL, JOHN, <i>The Hall, Thirsk, Yorks. (London).</i>
1930	BENYON, HENRY A., <i>Ufton Court, near Reading (Berkshire).</i>
1928	BOHANE, EDWARD, C.B.E., <i>Simmons Court House, Donnybrook, Co. Dublin (Ireland).</i>
1918	BURKE, U. ROLAND, <i>Edensor House, Bakewell (Derbyshire).</i>
1923	BURKITT, WILLIAM, <i>Grange Hill, Bishop Auckland (Durham).</i>
1931	BURRELL, WALTER R., <i>Knepp Castle, Horsham (Sussex).</i>
1929	*BUXTON, Capt. H. G., <i>Cokesford Farm, Tittleshall, King's Lynn.</i>
1928	CHRISTY, Capt. HUGH A., <i>Llangoed, Llysawen, Breconshire (South Wales).</i>
1924	COTTERELL, Sir JOHN R. G., Bart., <i>Garnons, Hereford (Herefordshire).</i>
1921	COURTHOPE, Col. Sir G. L., Bart., M.C., M.P., <i>Whiligh (Sussex).</i>
1921	*DAMPIER, Sir W. C. D., Sc.D., F.R.S., <i>Upwater Lodge, Cambridge.</i>
1927	DUGDALE, Major W. MARSHALL, D.S.O., <i>Llwyn, Llanfyllin, Mont. (North Wales).</i>
1929	ELGIN, Earl of, C.M.G., <i>Broomhall, Dunfermline (Scotland).</i>

*Nominated Member of Council.

Year when
first elected
on Council

Ordinary Members of the Council (continued).

1913	EVENS, JOHN, <i>Burton, Lincoln (Lincolnshire).</i>
1926	EVERARD, W. LINDSAY, M.P., <i>Ratchiffe Hall, Leicester (Leicestershire).</i>
1921	FENWICK, E. GUY, <i>North Luffenham Hall, Stamford (Rutland).</i>
1928	FORSYTH, THOMAS, <i>The Stud, Carlton-on-Trent, Newark (Notts.).</i>
1924	*GARRETT, Col. FRANK, C.B.E., <i>Aldringham House, Leiston, Suffolk.</i>
1922	GATES, B. J., <i>Pembury, Tring (Buckinghamshire).</i>
1916	GILBEY, Sir WALTER, Bart., <i>Elsenham Hall, Elsenham (Essex).</i>
1931	GLOSSOP, C. W. H., M.P., <i>Bramwith Hall, near Doncaster (Yorks., W. Riding).</i>
1925	HALE, WINDHAM E., <i>Mowbreck Hall, Kirkham (Lancashire).</i>
1925	HALL, J. HERBERT, <i>Hill House, Mobberley, Knutsford (Cheshire).</i>
1930	HANSFORD, Major C. C., <i>Watts Barn, Coedrington, Bristol (Gloucestershire).</i>
1905	HARRIS, JOSEPH, <i>Brackenburgh Tower, Penrith (Cumberland).</i>
1926	HASTINGS, Lord, <i>Milton Constable Park (Norfolk).</i>
1919	HOBBS, ROBERT, <i>Kelmscott, Lechlade, Glos. (Oxfordshire).</i>
1931	JERVOISE, Major F. H. T., <i>Herriard Park, Basingstoke (Hampshire).</i>
1923	JOHNSTONE, Capt. G. H., <i>Trewithen, Grampound Road (Cornwall).</i>
1932	KILPATRICK, JAMES, <i>Craigie Mains, Kilmarnock (Scotland).</i>
1931	*MACKINTOSH, Sir HAROLD, <i>Conyngham Hall, Knaresborough (Yorks., W. Riding).</i>
1909	MANSSELL, ALFRED, <i>College Hill, Shrewsbury (Shropshire).</i>
1928	MATTHEWS, R. BORLASE, <i>Greater Felcourt, East Grinstead (Surrey).</i>
1927	NEAME, THOMAS, <i>The Offices, Macknade, Faversham (Kent).</i>
1922	NELSON, R. B., <i>Holmwood, Sandiway, Northwich (Cheshire).</i>
1922	NEWTON, Sir DOUGLAS, K.B.E., M.P., <i>Croxton Park, St. Neots (Huntingdonshire).</i>
1932	*NICHOLSON, A. C., <i>Trent Ironworks, Newark, Notts.</i>
1915	OLIVER-BELLASIS, Capt. R., <i>Shilton House, Coventry (Warwickshire).</i>
1930	QUESTED, J. EGERTON, <i>The Firs, Cheriton, Folkestone (Kent).</i>
1928	RADNOR, Earl of, <i>Longford Castle, Salisbury (Wiltshire).</i>
1924	*RANSOME, EDWARD C., <i>Highwood, Ipswich.</i>
1927	*RUSSELL, Sir JOHN, D.Sc., F.R.S., <i>Rothamsted Experimental Station, Harpenden, Herts.</i>
1932	RYMAN, W. W., <i>Manor Farm, Wall, Lichfield (Staffordshire).</i>
1923	SAMPLE, C. H., 26, <i>St. Mary's Place, Newcastle-on-Tyne (Northumberland).</i>
1932	SCOTT, Capt. J. B., <i>Rotherfield Park, Alton (Hampshire).</i>
1932	SHAFFESBURY, Earl of, K.P., G.C.V.O., <i>St. Giles's House, Salisbury (Dorset).</i>
1931	SHELLEY, Sir J. F., Bart., <i>Posbury House, Crediton (Devonshire).</i>
1930	SMITH, EUSTACE ABEL, <i>Longhills, Lincoln (Lincolnshire).</i>
1907	SMITH, FRED, <i>Deben Haugh, Woodbridge (Suffolk).</i>
1929	STANLEY, Lord, M.C., M.P., <i>Knowsley, Prescott (Lancashire).</i>
1912	STRACHIE, Lord, <i>Sutton Court, Pensford (Somerset).</i>
1929	*STRAFFORD, Earl of, <i>Wrotham Park, Barnet (Middlesex).</i>
1923	TANNER, E. CRAIG, <i>Eyton-on-Severn, Wroster (Shropshire).</i>
1920	THORNTON, F. H., <i>Kingsthorpe Hall, Northampton (Northants).</i>
1930	TREOWEN, Maj.-Gen. Lord, C.B., C.M.G., <i>Llanarth Court, Raglan (Monmouthshire).</i>
1924	WAKEFIELD, JACOB, <i>Sedgwick House, Kendal (Westmorland).</i>
1926	WEBB, FRANK, <i>Billington Estate Office, Leighton Buzzard (Bedfordshire).</i>
1929	WEBB, S. OWEN, <i>Streety Hall, West Wickham (Cambridgeshire).</i>
1925	WEIGALL, Lt.-Col. Sir ARCHIBALD G., K.C.M.G., <i>Englemere, Ascot (London).</i>
1931	WHEATLEY, Lt.-Col. C. J. H., <i>Berkswell Hall, Coventry (Warwickshire).</i>
1889	WHEELER, Col. E. VINCENT V., <i>Newnham Court, Tenbury (Worcs.).</i>
1918	WICKHAM-BOYNTON, T. L., <i>Burton Agnes Hall, Driffield (Yorks., E. Riding).</i>

* Nominated Members of Council.

STANDING COMMITTEES.

* * Under Bye-Law 73, the PRESIDENT is a Member *ex officio* of all Committees, and the TRUSTEES and VICE-PRESIDENTS are Members *ex officio* of all Standing Committees except the Committee of Selection and General Purposes.

The Honorary Director is a Member ex officio of all Committees.

Finance Committee.

ADEANE, C. (<i>Chairman</i>)	COURTHOPE, Sir G. L.	HARRISON, W.
DEVONSHIRE, Duke of	HAZLERIGG, Sir A.	MANSSELL, ALFRED
CORNWALLIS, Lord	BURKE, U. ROLAND	SMITH, E. A.
DARESBURY, Lord	CRUTCHLEY, PERCY	WHEELER, Col.
BURRELL, Sir MERRIK	GRAVES, R. M.	

Journal and Education Committee.

CORNWALLIS, Lord	DAMPIER, Sir W. C. D.	BURKITT, W.
(<i>Chairman</i>)	HAZLERIGG, Sir A.	MANSSELL, ALFRED
ELGIN, Earl of	RUSSELL, Sir JOHN	NEAME, T.
RADNOR, Earl of	ADEANE, C.	WHEELER, Col.
MILDMAY OF FLETE, Lord	BROCKLEBANK, Rev.	
BURRELL, Sir MERRIK	C. H.	

Chemical Committee.

SMITH, FRED (<i>Chairman</i>)	BURKITT, W.	OLIVER-BELLASIS,
SHAFTESBURY, Earl of	GATES, B. J.	Capt. R.
HALECH, Lord	GRAVES, R. M.	QUESTED, J. E.
DAMPIER, Sir W. C. D.	HALE, W. E.	SAMPLE, C. H.
RUSSELL, Sir JOHN	NEILSON, R. B.	

Botanical and Zoological (Forestry and Orchards) Committee.

HASTINGS, Lord	BENYON, H. A.	JERVOISE, Major
(<i>Chairman</i>)	BURRELL, WALTER R.	LE SUEUR, A. D. C.
CORNWALLIS, Lord	CHRISTY, Capt. H. A.	NEAME, T.
TREOWEN, Lord	DALLIMORE, W.	WESTMAN, Col. C. C.
COURTHOPE, Sir G. L.	DUGDALE, Major	WHEELER, Col.
HAZLERIGG, Sir A.		

Veterinary Committee.

BURRELL, Sir MERRIK	BARCLAY, E. E.	HOBDAY, Prof. F. T. G.
(<i>Chairman</i>)	BELL, JOHN	JOHNSTONE, Capt.
RADNOR, Earl of	BURKE, U. ROLAND	MANSSELL, ALFRED
HASTINGS, Lord	BURRELL, WALTER R.	QUESTED, J. E.
MILDMAY OF FLETE, Lord	BUXTON, Capt. H. G.	SMITH, FRED
STRACHIE, Lord	CRUTCHLEY, PERCY	STANTFORTH, Lt.-Col.
COTTERELL, Sir JOHN	FENWICK, E. GUY	TANNER, E. C.
GILBEY, Sir WALTER	GATES, B. J.	THORNTON, F. H.
SHELLEY, Sir J. F.	GLOSSOP, C. W. H.	WHEATLEY, Lt.-Col.
WEIGALL, Sir A. G.	HARRIS, JOSEPH	

*Standing Committees.***Committee of Selection and General Purposes.**

DARESBURY, Lord	HARLECH, Lord	COURTHOPE, Sir G. L.
(<i>Chairman</i>)	MILDMAY OF FLETE,	GREAVES, R. M.
THE PRESIDENT	Lord	WHEELER, Col.

And the Chairman of each of the Standing Committees.

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DEVONSHIRE, Duke of	RUSSELL, Sir JOHN	GLOSSOP, C. W. H.
(<i>Chairman</i>)	WEIGALL, Sir A. G.	MATTHEWS, R. B.
RADNOR, Earl of	ADRIANE, C.	NEAME, T.
CORNWALLIS, Lord	BURKITT, W.	SMITH, FRED
HASTINGS, Lord	BURRELL, WALTER R.	THORNTON, F. H.
BURRELL, Sir MERRIK	BUXTON, Capt. H. G.	WIGAN, Capt. D. G.
DAMPIER, Sir W. C. D.		

Stock Prizes Committee.

EVENS, JOHN (<i>Chairman</i>)	BURKITT, W.	NEILSON, R. B.
RADNOR, Earl of	BUXTON, Capt. H. G.	QUESTED, J. E.
DARESBURY, Lord	CRUTCHLEY, PERCY	SMITH, FRED
BURRELL, Sir MERRIK	EVERARD, W. L.	TANNER, E. C.
COTTERELL, Sir JOHN	FENWICK, E. GUY	WEBB, FRANK
SHELLEY, Sir J. F.	FORSYTH, T.	WEBB, S. OWEN
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BEHRENS, Major CLIVE	GREAVES, R. M.	T. L.
BELL, JOHN	HOBBES, ROBERT	The Stewards of Live
BROCKLEBANK, Rev. C. H.	MANSSELL, ALFRED	Stock
BURKE, U. ROLAND		

Judges Selection Committee.—Same as Stock Prizes Committee.**Implement Committee.**

STANYFORTH, Lt.-Col.	CRUTCHLEY, PERCY	NICHOLSON, A. C.
E. W. (<i>Chairman</i>)	EVENS, JOHN	RANSOME, E. C.
COURTHOPE, Sir G. L.	GARRETT, Col.	SAMPLE, C. H.
DAMPIER, Sir W. C. D.	GATES, B. J.	WEBB, S. OWEN
BURKE, U. ROLAND	GREAVES, R. M.	WHEELER, Col.
BURKITT, W.	HARRISON, W.	The Steward of Im-
BUXTON, Capt. H. G.	MATTHEWS, R. B.	plements

Showyard Works Committee.

BURKE, U. ROLAND	BELL, JOHN	NICHOLSON, A. C.
(<i>Chairman</i>)	BURKITT, W.	SAMPLE, C. H.
DARESBURY, Lord	BURRELL, WALTER R.	STANYFORTH, Lt.-Col.
BURRELL, Sir MERRIK	CRUTCHLEY, PERCY	WEBB, S. OWEN
HAZLERIGG, Sir A.	HALL, J. H.	WHEATLEY, Lt.-Col.
MACKINTOSH, Sir H.	NEILSON, R. B.	

Dairy and Produce Committee.

BURKITT, W. (<i>Chairman</i>)	WEIGALL, Sir A. G.	JOHNSTONE, Capt. G. H.
STRACHIE, Lord	CRUTCHLEY, PERCY	KAY, Dr. H. D.
BURRELL, Sir MERRIK	EVENS, JOHN	OLIVER-BELLASIS,
DAMPIER, Sir W. C. D.	GREAVES, R. M.	Capt. R.
MACKINTOSH, Sir H.		

Standing Committees.

v

Horticultural Committee.

HAZLERIGG, Sir A.
(*Chairman*)

DARESBUY, Lord
BURKE, U. ROLAND

ANN, H. T.

General Derby Committee.

The Whole Council, with representatives of the Local Committee.

Honorary Director.—U. ROLAND BURKE.

Secretary.—T. B. TURNER, 16 Bedford Square, London, W.C.1.

Editor of Journal.—Prof. J. A. SCOTT WATSON, *School of Rural Economy, Oxford.*

Consulting Chemist.—Dr. J. AUGUSTUS VOELCKER, M.A., 1 Tudor St., E.C.4.

Consulting Veterinary Surgeon.—Prof. Sir F. T. G. HOBDAY, C.M.G., F.R.C.V.S.,
Royal Veterinary College, Camden Town, London, N.W.1.

Botanist.—Prof. Sir R. H. BEEFEN, F.R.S., *School of Agriculture, Cambridge.*

Zoologist.—CECIL WARBURTON, M.A., *School of Agriculture, Cambridge.*

Consulting Engineer.—S. J. WRIGHT, B.A., *Institute of Agricultural Engineering,*
37A St. Giles, Oxford.

Surveyor.—CHARLES H. R. NAYLOR, *St. Mary's Chambers, Queen Street, Derby.*

Publisher.—JOHN MURRAY, 50A Albemarle Street, W.1.

Solicitors.—GARRARD, WOLFE, GAZE & CLARKE, 18 St. James's Place, S.W.1.

Bankers.—WESTMINSTER BANK, LTD., 1 St. James's Square, S.W.1.

DISTRIBUTION OF GOVERNORS AND MEMBERS OF THE SOCIETY, AND OF ORDINARY MEMBERS OF THE COUNCIL.

Electoral District.	Division.	Number of Governors and Members.	Number of Ordinary Members of Council.	Ordinary Members of Council.
A.	BEDFORDSHIRE . . .	69	1	Frank Webb.
	CHESHIRE . . .	471	2	J. H. Hall; R. B. Neilson.
	CORNWALL . . .	73	1	Capt. G. H. Johnstone.
	DERBYSHIRE . . .	280	1	U. Roland Burke.
	DORSET . . .	100	1	Earl of Shaftesbury.
	HAMPSHIRE AND CHANNEL ISLANDS . . .	843	2	Major F. H. T. Jervoise; Capt. J. B. Scott.
	HERTFORDSHIRE . . .	182	1	E. E. Barclay.
	LANCASHIRE AND ISLE OF MAN . . .	840	2	Windham E. Hale; Lord Stanley.
	MIDDLESEX . . .	65	1	Earl of Strafford.
	MONMOUTHSHIRE . . .	67	1	Maj.-Gen. Lord Treowen.
	NORFOLK . . .	282	1	Lord Hastings.
	NORTHAMPTONSHIRE . . .	176	1	F. H. Thornton.
	NORTHUMBERLAND . . .	244	1	C. H. Sample.
	STAFFORDSHIRE . . .	211	1	W. W. Ryman.
	WORCESTERSHIRE . . .	151	1	Col. E. V. V. Wheeler.
	YORKSHIRE, N.R. . .	286	1	Major Clive Behrens.
	SCOTLAND . . .	289	2	Earl of Elgin; James Kilpatrick.
		— 3,529	— 21	
B.	BUCKINGHAMSHIRE . . .	140	1	B. J. Gates.
	DEVON . . .	163	1	Sir J. F. Shelley.
	DURHAM . . .	148	1	W. Burkitt.
	ESSEX . . .	229	1	Sir Walter Gilbey.
	HEREFORDSHIRE . . .	143	1	Sir John R. G. Cotterell.
	LEICESTERSHIRE . . .	193	1	W. Lindsay Everard.
	LONDON . . .	454	2	John Bell; Sir A. G. Weigall.
	NOTTINGHAMSHIRE . . .	184	1	Thomas Forshaw.
	RUTLAND . . .	38	1	E. Guy Fenwick.
	SHERIFFSHIRE . . .	297	2	Alfred Mansell; E. Craig Tanner.
	SUFFOLK . . .	284	1	Fred Smith.
	SURREY . . .	196	1	R. Borlase Matthews.
	WILTSHIRE . . .	174	1	Earl of Radnor.
	YORKSHIRE, W.R. . .	301	2	C. W. H. Glossop; Sir Harold Mackintosh.
	SOUTH WALES . . .	95	1	Capt. H. A. Christy.
		— 2,989	— 18	
C.	BERKSHIRE . . .	199	1	H. A. Benyon.
	CAMBRIDGESHIRE . . .	168	1	S. Owen Webb.
	CUMBERLAND . . .	184	1	Joseph Harris.
	GLAMORGAN . . .	70	1	Hubert Alexander.
	GLOUCESTERSHIRE . . .	280	1	Major C. C. Hansford.
	HUNTINGDONSHIRE . . .	28	1	Sir Douglas Newton.
	KENT . . .	313	2	Thomas Neame; J. E. Quested.
	LINCOLNSHIRE . . .	267	2	John Evens; Eustace Abel Smith.
	OXFORDSHIRE . . .	172	1	Robert Hobbs.
	SOMERSET . . .	150	1	Lord Strachie.
	SUSSEX . . .	344	2	Walter R. Burrell; Sir G. L. Courthope.
	WARWICKSHIRE . . .	297	2	Capt. R. Oliver-Bellasis; Lt.-Col. C. J. H. Wheatley.
	WESTMORLAND . . .	80	1	Jacob Wakefield.
	YORKSHIRE, E.R. . .	106	1	T. L. Wickham-Boynnton.
	IRELAND . . .	69	1	Edward Bohane.
	NORTH WALES . . .	232	1	Major W. Marshall Dugdale.
		— 2,909	— 20	
FOREIGN COUNTRIES . . .		208		*Capt. H. G. Buxton.
MEMBERS WITH NO ADDRESSES . . .		20	5	*Sir W. C. D. Dampier.
GRAND TOTALS . . .		9,655	64	*Col. Frank Garrett. *E. C. Ransome. *Sir John Russell.

* Nominated Members of Council.

TABLE SHOWING THE NUMBER OF GOVERNORS AND MEMBERS
IN EACH YEAR FROM THE ESTABLISHMENT OF THE SOCIETY.

Year.	President of the Year.	Governors		Members.			Total.
		Life.	Annual	Life.	Annual.	Honor-ary.	
1839	3rd Earl Spencer	—	—	—	—	—	1,100
1840	5th Duke of Richmond	80	189	146	2,434	5	2,860
1841	Mr. Philip Pusey	91	219	231	4,047	7	4,595
1842	Mr. Henry Handley	101	211	323	5,194	15	5,849
1843	4th Earl of Hardwicke	94	209	429	6,155	15	6,902
1844	3rd Earl Spencer	95	214	442	6,161	15	6,927
1845	5th Duke of Richmond	91	198	527	5,899	15	6,733
1846	1st Viscount Portman	92	201	554	6,105	19	6,971
1847	6th Earl of Egmont	91	195	607	5,478	20	6,391
1848	2nd Earl of Yarborough	93	186	648	5,387	21	6,335
1849	3rd Earl of Chichester	89	178	582	4,043	20	5,512
1850	4th Marquis of Downshire	90	169	627	4,356	19	5,261
1851	5th Duke of Richmond	91	162	674	4,175	19	5,121
1852	2nd Earl of Ducie	93	156	711	4,002	19	4,981
1853	2nd Lord Ashburton	90	147	739	3,923	19	4,923
1854	Mr. Philip Pusey	88	146	771	4,152	20	5,177
1855	Mr. William Miles, M.P.	89	141	795	3,838	19	4,832
1856	1st Viscount Portman	85	180	839	3,896	20	4,979
1857	Viscount Ossington	83	187	896	3,933	19	5,068
1858	8th Lord Berners	81	133	904	4,010	18	5,146
1859	7th Duke of Marlborough	78	130	927	4,008	18	5,161
1860	5th Lord Walsingham	72	119	927	4,047	18	5,133
1861	3rd Earl of Powis	84	90	1,113	3,323	18	4,633
1862	H.R.H. The Prince Consort 1st Viscount Portman	83	97	1,151	3,475	17	4,823
1863	Viscount Eversley	80	88	1,268	3,785	17	5,133
1864	2nd Lord Feversham	78	45	1,343	4,013	17	5,406
1865	Sir E. C. Kerrison, Bart., M.P.	79	81	1,386	4,190	16	5,752
1866	1st Lord Tredegar	79	84	1,395	4,040	15	5,622
1867	Mr. H. S. Thompson	77	82	1,388	3,993	15	5,465
1868	6th Duke of Richmond	75	74	1,409	3,888	15	5,461
1869	H.R.H. The Prince of Wales, K.G.	75	78	1,417	3,864	17	5,446
1870	7th Duke of Devonshire	74	74	1,511	3,764	15	5,436
1871	6th Lord Vernon	72	74	1,589	3,896	17	5,643
1872	Sir W. W. Wynn, Bart., M.P.	71	73	1,655	3,953	14	5,763
1873	3rd Earl Cathcart	74	62	1,332	3,936	12	5,316
1874	Mr. Edward Lielland	76	58	1,044	3,756	12	5,346
1875	1st Viscount Blandford	79	79	2,058	3,918	11	5,145
1876	2nd Lord Chesham	83	78	2,104	4,018	11	6,349
1877	Lord Skelmersdale	81	76	2,239	4,073	17	6,486
1878	Col. Kingscote, C.B., M.P.	81	72	2,328	4,130	26	6,687
1879	I.R.H. The Prince of Wales, K.G.	81	72	2,453	4,700	26	7,332
1880	9th Duke of Bedford	83	70	2,373	5,083	20	7,929
1881	Mr. William Wells	85	69	2,765	5,041	19	7,979
1882	Mr. John Dent Dent	82	71	2,840	5,059	19	8,039
1883	6th Duke of Richmond and Gordon	78	71	2,979	4,952	19	8,099
1884	Sir Brandreth Gibbs	72	72	3,208	5,408	21	8,776
1885	Sir Massey Lopes, Bart., M.P.	71	69	3,356	5,619	20	9,135
1886	H.R.H. The Prince of Wales, K.G.	70	61	3,414	5,569	20	9,134
1887	Lord Egerton of Tatton	71	64	3,440	5,387	20	8,982
1888	Sir M. W. Ridley, Bart., M.P.	66	56	3,521	5,225	16	8,884
1889	HER MAJESTY QUEEN VICTORIA	73	53	3,567	7,153	15	10,866
1890	Lord Moreton	122	58	3,346	6,941	17	10,964
1891	2nd Earl of Ravensworth	117	60	3,311	6,921	19	10,923
1892	1st Earl of Feversham	111	69	3,784	7,066	20	11,050
1893	1st Duke of Westminster, K.G.	107	74	3,786	7,138	21	11,126
1894	8th Duke of Devonshire, K.G.	113	73	3,798	7,212	22	11,213
1895	Sir J. H. Thorold, Bart.	120	80	3,747	7,179	23	11,149
1896	Sir Walter Gilbey, Bart.	126	83	3,695	7,253	23	11,180
1897	H.R.H. The Duke of York, K.G.	123	83	3,705	7,235	24	11,223
1898	5th Earl Spencer, K.G.	121	79	3,637	7,132	25	11,094
1899	Earl of Coventry	118	75	3,656	7,009	23	10,879
1900	H.R.H. The Prince of Wales, K.G.	111	71	3,623	6,833	24	10,666
1901	3rd Earl Cawdor	102	70	3,564	6,336	27	10,033
1902	H.R.H. Prince Christian, K.G.	100	69	3,500	5,955	26	9,650
1903	H.R.H. The Prince of Wales, K.G.	99	62	3,439	5,771	27	9,893
1904	16th Earl of Derby, K.G.	96	68	3,375	5,906	32	9,477
1905	9th Lord Middleton	89	78	3,212	5,758	33	9,170
1906	Mr. F. S. W. Cornwallis	94	155	3,132	6,139	30	9,600

TABLE SHOWING THE NUMBER OF GOVERNORS AND MEMBERS
IN EACH YEAR FROM THE ESTABLISHMENT OF THE SOCIETY—*contd.*

Year.	President of the Year.	Governors.		Members.			Total.
		Life.	Annual.	Life.	Annual.	Honor-ary.	
1907	4th Earl of Yarborough . . .	91	174	3,076	6,299	29	9,669
1908	9th Duke of Devonshire . . .	89	178	3,019	6,442	30	9,758
1909	7th Earl of Jersey, G.C.B. . .	91	177	2,951	6,696	31	9,946
1910	Sir Gilbert Greenall, Bart. . .	86	166	2,878	6,934	31	10,095
1911	HIS MAJESTY KING GEORGE V . .	85	168	2,805	7,191	30	10,279
1912	9th Lord Middleton . . .	85	170	2,741	7,283	30	10,309
1913	2nd Earl of Northbrook . . .	89	168	2,691	7,474	26	10,448
1914	4th Earl of Powis . . .	89	173	2,626	7,629	28	10,545
1915	Duke of Portland, K.G. . . [K.G.	88	184	2,517	7,318	28	10,130
1916	7th Duke of Richmond and Gordon,	88	185	2,427	7,526	27	10,248
1917	Mr. Charles Adeane, C.B. . .	93	210	2,412	8,214	26	10,955
1918	Hon. Cecil T. Parker . . .	102	224	2,395	8,226	25	10,972
1919	Sir J. B. Bowen-Jones, Bart. . .	119	236	2,411	8,558	24	11,848
1920	H.R.H. The Prince of Wales, K.G. .	129	256	2,402	8,208	25	12,020
1921	Mr. R. M. Greaves . . .	137	275	2,374	10,098	24	12,908
1922	H.R.H. The Duke of York, K.G. .	144	287	2,317	10,596	22	13,366
1923	Lt.-Col. E. W. Stanforth . . .	153	293	2,262	10,778	20	13,506
1924	Mr. Ernest Mathews, C.V.O. . .	159	289	2,201	10,676	21	13,346
1925	Sir Gilbert Greenall, Bart., C.V.O.	158	291	2,160	10,940	15	13,573
1926	Lord Desborough, G.C.V.O. . .	155	276	2,108	10,251	15	12,800
1927	Viscount Tredegar, C.B.E. . .	153	257	2,085	9,343	15	11,808
1928	Lord Harlech, C.B. . .	155	277	1,972	9,042	16	11,462
1929	Earl of Harewood, K.G. . .	154	273	1,914	8,818	16	11,170
1930	H.R.H. The Duke of Gloucester, K.G.	153	264	1,882	8,491	16	10,811
1931	Sir Arthur Hazlerigg, Bart. . .	153	245	1,828	8,036	16	10,278
1932	Lord Mildmay of Flete . . .	144	223	1,774	7,501	13	9,655

**STATEMENT made to the Council by the Chairman of
the Finance Committee, on presenting the Accounts
for the year 1932.**

MR. ADREANE, in presenting the accounts to the Council, said that they were, with one exception, satisfactory, the exception being the reduced income received from membership. The Society began the year with a balance of £2,433; the ordinary receipts during the year amounted to £16,630 against £17,649 in 1931, a decrease of £1,019 due to loss of membership. Other receipts amounted to £2,486, making with the amount brought in a total of £21,549. The ordinary expenditure was £16,374, and there was further expenditure of £335; in addition £2,500 was invested. The credit balance of cash at Bankers and in hand at the end of the year was £2,339. During the past year they had paid in connection with the revised edition of *Fream's Elements of Agriculture* £1,340. This was non-recurrent and would be a source of revenue in the future, as the demand for the book was very satisfactory.

The point for remark in the Balance-sheet was the remarkable rise in the value of their investments. The market value of the Reserve Fund was £187,788 as compared with £144,544 on December 31st, 1931, an appreciation of £43,244. This was satisfactory so far as capital was concerned, but was of no advantage to their annual income. It would be noticed that they had made an investment of £2,500, which had purposely not been added to the Reserve as it was thought advisable to keep this sum available until the result of the Show at Derby was known. In an ordinary year this sum would have been placed on deposit, but as only 1 per cent. could be obtained from the bankers for money on deposit the Committee thought it best to invest the money temporarily in a stock yielding about 3½ per cent. which could be readily realised at any time if required.

With regard to Estimates of receipts and expenditure for 1933, income was estimated at £15,758. The estimated expenditure was £15,251, leaving an

estimated surplus of receipts over expenditure of £507. He regretted to say that they had been obliged to write down their estimate from subscriptions by £650 for the present year.

The membership of the Society had decreased during the past year by 618. He thought it would be interesting to the Council to know how the Society stood in 1925, which was the year when it had the greatest number of Members. In that year the Governors and Members numbered 13,573. To-day the number was 9,655, a loss in membership of 3,918. The loss in subscriptions, apart from life compositions, was £3,174. Hitherto the Society had been able very largely to balance the loss in membership by building up a reserve, but this could not go on indefinitely, and, if these decreases continued, the income of the Society would be seriously affected. In spite of the difficult times, therefore, everything possible must be done to increase the membership. The Finance Committee wished to acknowledge the successful efforts made by some members of the Council this year which had resulted so far in an increase of 31 new members over the figures for the same period last year. This was distinctly encouraging, and it was hoped that other members of Council would make similar efforts.

The Accounts and Balance-sheet were then adopted, together with the Estimate for the ensuing year, as below:—

ESTIMATE OF ORDINARY RECEIPTS AND Expenditure for 1926
(Other than in respect of the Show).

Prepared by direction of the Finance Committee

Actual figures for 1925.		Estimate for 1926.
£	Receipts.	£
8,951	Subscriptions of Governors and Members	8,300
246	Interest on Daily Balances and Deposit Account	100
6,838	Interest on Investments	6,668
176	Sales of Journals, Text Books, Pamphlets, etc.	280
148	Advertisements in Journal	150
65	Income Tax to be refunded	65
—	Miscellaneous	—
179	N.D.D. Entry Fees, etc.	170
27	Hire of Council and Committee Rooms	25
16,630		15,758
£	Expenditure.	£
4,220	Salaries :—Secretary and Official Staff	4,280
284	Pension (Share of) to late Secretary	870
1,026	House, Rent, Lighting, Cleaning, Wages, &c. (say)	1,020
816	Printing and Stationery	400
132	Postage	120
192	Miscellaneous	200
1,795	Journal	1,600
409	Chemical Department	410
250	Botanical Department	250
200	Zoological Department	200
403	Veterinary Department	403
50	Grant to Research Institute, Reading University	50
342	Examinations for National Diploma	350
3,500	Amount set aside towards loss on Show	3,500
18,119		18,158
£	Exceptional Expenditure.	£
1,488	Scientific Research	1,500
—	Additions, Alterations, Painting, Cleaning and Repairs to Society's House and Council Chamber	58
6	Repairs to Furniture	—
27	Library :—Binding and Purchase of Books	25
302	Legal Charges and Auditors' Fees (say)	300
8	Certificates and Medals for Long Service and Skilled Labour	10
1,840	"Elements of Agriculture"—new edition	110
94	Dinner to Secretaries of Breed Societies	100
16,374		15,251
		£
	Estimated Receipts	15,758
	Estimated Expenditure	15,251
	Estimated surplus of Receipts over Expenditure	£507

STATEMENT OF RECEIPTS AND EXPENDI-

JULY 5 to

Corresponding figures for 1931.		Receipts.	£	s.	d.	£	s.	d.
2,000		Contribution from Local Committee to Show Fund*				5,215	14	10
2,158		Prizes given by Agricultural and Breed Societies and others .				1,927	6	9
1,373		Prizes given by Warwick Local Committee*				—		
		FEEs FOR IMPLEMENTS, MACHINES AND MISCELLANEOUS EXHIBITS :—						
9,924		Exhibitors' payments for Shedding and Space .	7,934	1	6			
235		Non-Members' Fees for entry of Implements, etc. .	200	2	0			
145		Fees for entry of "New Implements" .	60	0	0			
						8,194	3	6
10,304								
		FEEs FOR ENTRY OF LIVE STOCK :—						
1,401		330 Members' Entries @ 3l. .	990	0	0			
2,912		981 do. do. @ 22 10s. .	2,452	10	0			
1,848		1,048 Members' Entries @ 30s. .	1,572	0	0			
307		238 Members' Entries @ 1l. .	236	0	0			
51		68 Members' Entries @ 15s. .	51	0	0			
21		25 Members' Entries @ 10s. .	12	10	0			
12		50 Members' Entries @ 5s. .	12	10	0			
66		Entrance fees .	88	1	0			
174		24 Non-Members' Entries @ 6l. .	144	0	0			
165		42 do. do. @ 5l. .	210	0	0			
75		24 Non-Members' Entries @ 3l. .	72	0	0			
26		15 Non-Members' Entries @ 2l. .	30	0	0			
—		7 Non-Members' Entries @ 30s. .	10	10	0			
20		33 Non-Members' Entries @ 1l. .	33	0	0			
1		3 Non-Members' Entries @ 10s. .	1	10	0			
—		10 Non-Members' Entries @ 5s. .	2	10	0			
—		New Forest Pony classes .	6	10	0			
7,079			5,924	11	0			
98		Less :—Fees returned in connection with outbreaks of Swine Fever .	6	0	0			
6,981						5,918	11	0
		FEEs FOR ENTRY OF POULTRY :—						
107		Members :—398 Entries @ 4s. .	79	12	0			
157		Non-Members :—442 Entries @ 6s. .	132	12	0			
10		Entrance Fees .	—					
274						212	4	0
		OTHER ENTRY FEES :—						
98		Produce .	108	0	0			
192		Horse-jumping Competitions .	178	0	0			
13		Plantations Competition .	39	0	0			
9		Orchards and Fruit Plantations Competition .	13	15	0			
43		Butter-Making Competitions .	39	10	0			
355						373	5	0
		CATALOGUE :—						
15		Extra lines for particulars of Implement exhibits .	10	0	0			
5		Woodcuts of "New Implements" .	1	17	6			
675		Advertising in Catalogue .	574	3	4			
26		Sales of Implement Section of Catalogue .	20	14	11			
769		Sales of Combined Catalogue .	456	11	1			
50		Sales of Jumping Programmes .	34	7	0			
1,540			1,097	18	10			
75		Less :—Expenses of Sales Superintendent and Assistants .	70	8	5			
1,465						1,021	10	5
224,910		Carried forward .				222,862	15	6

TURE OF THE SHOW AT SOUTHAMPTON, JULY 9, 1932.

Corresponding figures for 1931.		Expenditure.			
£			£ s. d.	£ s. d.	
3,523	{	COST OF ERECTION AND MAINTENANCE OF SHOWYARD:—			
536		Transferring Society's permanent buildings from Warwick to Southampton (including taking down and re-erecting)	3,543	13	4
2,163		Fencing round Showyard	482	4	9
6,068		Implement Shedding	1,676	1	9
188		Stock Shedding	4,877	16	1
415		Stock Shedding for Isolation Camp			
612		Poultry and Produce Sheds	389	18	2
117		Dairy	597	7	2
111		Fodder Shed and Office	115	0	6
903		Forestry Tent	104	12	6
904		Grand Stand and Large Ring	866	14	0
318		Various Offices and Stands	882	13	11
117		Painting Signs and Fixing Ditto, Fencing and Judging Rings	185	0	9
2,109		Insurance	93	14	9
1,369		Hire of Canvas	1,779	5	2
70	{	General Labour (including Society's Clerk of Works) and	1,121	9	1
98		Horse Hire	68	16	6
		Bee Shed	93	15	11
19,621			18,880	4	4
37		Less 74 Flagpoles @ 10s.	87	0	0
19,584				18,843	4 4
—		EXTRAORDINARY EXPENDITURE:—			
		Rent of ground, cost of preparing and restoring same, and providing Gas and Water		2,464	14 1
		SURVEYOR:—			
711	{	Salary, £500; Travelling and Hotel Expenses, £113 19s. 2d.		662	4 8
		Clerk, £10 10s.; Stationery and Sundry Expenses, £37 15s. 6d.			
		PRINTING:—			
636	{	Printing of Prize Sheet, Entry Forms, Admission Orders, Circulars to Exhibitors, Prize Cards, Tickets, and Miscellaneous (including stationery)	585	8	8
41		Programmes for Members	29	10	9
812		Catalogue: Printing and paper	690	17	0
203		Catalogue: Binding	177	2	2
8		Catalogue: Carriage	9	5	0
35		Awards Lists	85	17	6
15		Programmes of Jumping Competitions	17	7	6
1,750				1,554	3 7
		ADVERTISING:—			
217	{	Advertising Closing of Entries in Newspapers	175	0	4
496		Advertising Show in Newspapers	262	8	6
877		Billposting and Advertising Boards, etc.	829	2	0
255		Printing and writing Posters, Window Cards, etc.	238	16	0
1,845				1,505	6 10
		POSTAGE, CARRIAGE, ETC.:—			
220	{	General Postage	206	11	2
58		Postage of Badges to Members	53	18	6
14		Carriage of Luggage, etc.	16	4	6
292				276	9 8
11,741		AMOUNT OF PRIZES AWARDED, (including £1,927 6s. 9d., given by various Societies)			
				10,379	1 8
		COST OF FORAGE FOR LIVE STOCK:—			
1,154	{	Hay, £187 0s. 8d.; Straw, £663 4s. 6d.; Green Food, £185 17s. 7d.		989	8 9
		JUDGES' FEES AND EXPENSES:—			
587	{	Judges of:—New Implements, £38 18s. 8d.; Horses, £78 12s. 10d.; Cattle, £156 14s. 5d.; Sheep, £115 8s. 7d.; Pigs, £47 9s. 9d.; Produce, £41 6s. 9d.; Goats, £4 5s.; Luncheons, £70		542	11 0
52		Badges for Judges and other officials		25	7 8
64		Rosettes			
£37,780		Carried forward		567	18 8

STATEMENT OF RECEIPTS AND EXPENDITURE

Corresponding figures for 1981. £	Receipts (contd.).		£	s.	d.
24,910	Brought forward		22,862	15	6
	MISCELLANEOUS RECEIPTS :—				
1,140	Admissions to Flower Show	675	15	9	
1,872	Motor Parks	1,900	18	0	
185	Rent for Railway Offices	185	0	0	
75	Premium for Cloak Rooms	60	0	0	
170	Rent for Ministry of Agriculture Pavilion	170	0	0	
200	Advertisements in Stock Prize Sheet	218	10	3	
5	Bathchairs	4	3	6	
27	Miscellaneous	28	0	5	
200	Contribution from Local Committee to cost of "Musical Ride" *				
			2,637	7	11
3,874					
	ADMISSIONS TO SHOWYARD :—				
911	Tuesday, July 5, @ 10s.	554	15	0	
2,720	Wednesday, July 6, @ 5s. and 3s.	1,540	19	0	
3,488	Thursday, July 7, @ 3s.	1,704	11	9	
1,802	Friday, July 8, @ 2s. 6d.	1,447	10	2	
945	Saturday, July 9, @ 1s.	684	0	6	
118	Season Tickets	86	18	0	
475	Day Tickets	312	6	5	
			6,330	15	10
10,459					
	ENTRANCES TO HORSE RING :—				
252	Wednesday, July 6	181	6	0	
234	Thursday, July 7	171	10	0	
197	Friday, July 8	166	0	0	
173	Saturday, July 9	122	2	0	
804	Tickets sold for Reserved Enclosure	525	1	8	
			1,165	19	8
1,660					
115	Sales of Produce at Dairy		118	5	4
40	Outstanding Receipts in respect of Warwick Show		9	19	4
			33,125	3	7
41,058					
3,297	Debit Balance		7,802	7	8
	*NOTE.—The contribution of the Local Committee to the Show Fund represents the balance of the Local Fund (after deducting expenses of collection); and is intended to cover, as far as possible, the usual contributions made by Local Committees for Prizes, etc., and the cost of the provision and preparation of the Showground.				
<u>£44,355</u>			<u>£40,927</u>	<u>10</u>	<u>10</u>

Examined, audited, and found correct, this 15th day of November, 1982.
T. B. TURNER, Secretary.
PRICE, WATERHOUSE & Co.,
Chartered Accountants.

OF THE SHOW AT SOUTHAMPTON (continued).

Corresponding figures for 1931.
£
37,780

Expenditure (contd.).

£ s. d. £ s. d.

Brought forward 35,283 18 0

GENERAL ADMINISTRATION:—

245	Honorary Director :—Travelling, Entertaining, etc.	169 17 10
89	Stewards of Stock and Implements :—Personal and Railway Expenses, etc.	80 1 11
192	Assistant Stewards of Stock :—Personal and Railway Expenses	186 3 2
368	Official Staff :—Extra Clerks, £128 14s. 5d.; Lodgings, £40 9s. 10d.; Maintenance of Staff, £66 17s. 1d.; Travelling Expenses, £7 6s. 1d.; Secretary's Hotel and Travelling Expenses, £187 8s. 10d.	875 16 8
220	Finance Office :—Stewards, £26 17s.; Finance Clerk, £10 9s.; Grand Stand Men, £68 8s. 8d.; Turnstile Men, £68 8s. 9d.; Bank Staff, £51 14s. 8d.; Refreshments, £9 15s. 11d.; Hire of Van, £5 5s.	235 8 10
32	Awards Office :—Clerks, £64 6s. 10d.; Boys, £13 15s.	78 1 10
		1,125 9 10

1,196

General Management :—

153	Foremen and Assistant Foremen	166 7 11
80	Yardmen	69 5 5
146	Door and Gate Keepers	151 15 3
40	Motor Parks :—Tents, Offices, etc.	28 17 1
114	Veterinary Department :—Veterinary Inspectors	116 18 4
61	Engineering Department :—Consulting Engineer	130 8 0
1,009	Police :—County Police, £454; Commissionaires, £26 11s. 4d.	480 11 4
		1,143 18 4

1,603

Dairy :—Steward and Assistant Stewards, £92 7s.; Staff, £215 6s. 9d.; Milk, £212 7s.; Ice, £19 5s.; Utensils, £75 0s. 9d.; Engineers, £111 5s. 10d.; Labour, £11 10s. 8d.; Butter and Cheese Boxes, £8 2s. 12d.; Refreshments, £21 19s. 10d.; Fuel, £4 15s.; Miscellaneous, £16 5s. 8d.

808		788 4 9
9	Analysis of Cider	10 0 0
106	Poultry :—Penning and Feeding, £59 5s.; Cartage, £16 16s. 4d.; Judges, £35 11s. 8d.; Superintendent, £14 13s. 6d.	126 6 6
		924 11 3

923

Flower Show :—Steward and Assistant, £26 9s.; Manager, £57 12s.; Hire of Tents, etc., £449 2s. 6d.; Judges, £21 7s. 7d.; Medals, £14 8s. 5d.; Labour and Miscellaneous, £79 8s. 4d.; Carriage and Cartage, £87 9s. 8d.

702		685 12 1
-----	--	----------

64	Plantations Competition	82 19 0
64	Orchards and Fruit Plantations Competition	100 1 8
164	Forestry (excluding Tent)	142 17 8
570	"Musical Ride"	394 1 11

GENERAL SHOWYARD EXPENSES:—

185	Band	170 0 0
335	Hire of Furniture and Chairs	197 15 0
20	Telephone and Call Boxes	10 10 1
6	Telegraph Facilities	88 18 0
59	Official Luncheons	56 0 0
62	St. John Ambulance	54 2 4
12	Billposting in Showyard	14 10 0
12	Medals	18 17 9
43	Engraving and forwarding Cups	88 8 0
19	Plans, Blocks and Maps	21 8 8
6	Tan	9 12 6
229	Sleepers	144 9 0
29	Hire of Tents and Marquee	29 5 0
11	Weightbridge : Carriage and Erection Charges	36 19 0
78	Testing New Implements for Silver Medal and cost of Medals	88 4 2
113	Miscellaneous	111 0 5
36	Gas, Electric Light, Coal and Firewood	48 15 11
14	Bathchairs	5 14 11
		1,029 0 9

1,269

Outstanding accounts in respect of Warwick Show 15 0 4

£44,355

£40,827 10 10

Debit balance (as above)

£7,528 7 8

Less :—Contribution from Ordinary Account to Show Fund

£5,500 0 0

£2,028 7 8

STATEMENT OF RECEIPTS AND

Figures for 1981. £	Receipts.	£	s.	d.	£	s.	d.	£	s.	d.
	CASH AT BANKERS AND IN HAND, JANUARY 1, 1982 :—									
3	Reserve Fund Account				299	15	0			
2,597	Current Account				1,978	12	1			
159	Petty Cash at Bank and in hand				154	8	8			
								2,432	15	9
2,759										
	ANNUAL SUBSCRIPTIONS :—									
1,386	Governors' for 1982	1,186	2	0						
8,446	Members' for 1982	7,685	5	9						
49	Subscriptions for previous years	61	16	0						
	LIFE GOVERNORS AND MEMBERS :—									
28	Annual Contributions	27	7	0				8,950	10	9
9,909										
	MISCELLANEOUS :—									
6,837	Interest on Investments	6,838	7	8						
291	Interest on Daily Balances and Deposit Account	245	15	4						
78	Income Tax refunded	65	5	7						
39	Sales of Pamphlets, Farm Account Books, etc.	30	13	0						
2	Sales of Library Catalogue	—								
64	Sales of Text Books	57	13	10						
96	Sales of Journals	87	7	8						
152	Advertisements in Journal	143	2	4						
158	N.D.D. : Entry Fees and Sales of Exam. Papers	178	11	6						
29	Hire of Council and Committee rooms	27	6	0				7,879	2	6
7,740										
17,649	Total of Ordinary Receipts							16,629	13	3
296	Life Compositions of Governors and Members	205	0	0						
151	Donations to Society's Funds	106	14	5						
148	Subscriptions for 1988	120	10	0						
—	Argentine Rural Society—balance owing 1981	52	14	8						
140	Refunded in respect of payments to Willesden Urban District Council	142	12	9						
7	Show Account : for amount owing on Dec. 31, 1981	8	1	10						
—	Bonus on Conversion of 5% War Stock	152	18	11						
—	Amount transferred from Deposit Account	1,697	12	9				2,486	5	4
742										

PAYMENTS FOR THE YEAR 1932.

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Figures for 1931.		Payments.	£	s.	d.	£	s.	d.	£	s.	d.
2		GENERAL ADMINISTRATION :—									
4,288		Salaries : Secretary and Official Staff (including clerical assistance)	4,220	2	6						
310		Pensions to Officials	283	10	11						
256		Legal Charges and Auditors' Fees, etc.	302	0	6						
1,006		Rent, Rates, Taxes, Insurance and House Expenses	1,026	8	1						
408		Printing and Stationery	316	9	7						
178		Postage	181	12	7						
196		Telephones, Telegrams and Miscellaneous Expenses	192	1	9						
6,642						6,472	5	11			
		JOURNAL OF THE SOCIETY :—									
		Cost of Volume 92 :—									
951		Printing and Binding	1,048	17	11						
274		Postage	287	1	10						
148		Editing and Literary Contributions	463	14	0						
12		Illustrations	19	11	4						
1,385			1,789	5	1						
5		On account of Volume 93	5	5	0						
1,390						1,794	10	1			
10		Advertising Farm Account Books									
		LABORATORY :—									
415		Salary and Petty Cash				408	11	9			
		OTHER SCIENTIFIC DEPARTMENTS :—									
250		Botanist's Salary	250	0	0						
200		Zoologist's Salary	200	0	0						
400		Grant to Royal Veterinary College	400	0	0						
100		Grant to Research Institute, Reading	50	0	0						
3		Medal for Proficiency in Cattle Pathology	2	14	0						
953						902	14	6			
		NATIONAL DIPLOMA IN AGRICULTURE :—									
304		Honoraria and Expenses of Examiners	310	18	11						
65		Travelling Expenses of Officials, etc.	82	17	11						
107		Hotel Expenses of Examiners, Officials, etc.	111	11	1						
71		Printing, Stationery, Diplomas and Postage	88	8	2						
7		Hire of Premises	7	7	0						
75		Allowance for Assistant	75	0	0						
629			675	18	1						
502		Less Entry Fees and Sales of Examination Papers	556	8	10						
127			119	14	8						
64		Less amount paid by Highland and Agricultural Society	59	12	6						
63						60	1	9			
		NATIONAL DIPLOMA IN DAIRYING :—									
133		Honoraria and Expenses of Examiners	116	9	1						
74		Hotel and Travelling Expenses	84	1	2						
62		Printing, Diplomas, Postage, and allowance for assistant	61	19	8						
31		Hire of Premises and balance of Expenses re 1931 Exam. (For Entry Fees, Sales of Exam. Papers, etc., see contra.)	19	14	7						
300						282	4	1			
		EXTRA EXPENDITURE :—									
1,689		Grant to Research Fund	1,483	10	4						
24		Library : Binding and Purchase of Books	27	0	0						
567		Additions, Alterations, Painting and Repairs to house									
48		Cleaning and Painting Council Chamber									
133		Repairs to Furniture	6	5	0						
		Certificates and Medals for Long Service	2	10	2						
		New Text Book : "Elements of Agriculture"	1,889	12	6						
98		Dinner to Secretaries of Breed Societies	94	5	5						
15		Donation to Young Farmers' Clubs									
100		Grant to Leathersellers' Co. re Warble Fly Investigation									
50		Grant to Butter Marketing Order Committee									
2,724						2,958	4	5			
3,500		Amount set aside towards Loss on Shows				8,500	0	0			
15,997		Total of Ordinary Payments							16,878	12	6
53		Argentine Rural Society (recoverable)				5	12	0			
260		Payments to Willesden Urban District Council	269	17	5						
2,097		Transfer to Deposit Account									
		Purchase of Metropolitan Water (E) Stock	2,500	0	0						
190		Additions to Show Plant	25	0	0						
83		Additions to Furniture and Equipment	38	10	0						
19		Show Account : for Postage, etc.	1	14	6						
18		Grant to Cambridge University re Rockefeller Foundation									
2,720									2,885	13	11
		CASH AT BANKERS AND IN HAND, DECEMBER 31ST, 1932 :—									
300		Reserve Fund Account				4	0	0			
1,979		Current Account	2,180	6	5						
154		Petty Cash at Bank and in Hand	185	1	6						
2,433									2,869	7	11
£21,150									£21,548	14	4

Dr.

BALANCE SHEET,

Figures for 1931. £		£	s.	d.	£	s.	d.	£	s.	d.
	To SUNDRY CREDITORS—									
2,253	Sundry Accounts owing				1,802	10	7			
148	Subscriptions received in 1932 but belonging to 1933				120	10	0			
								1,923	0	7
2,401										
	To CAPITAL and RESERVE FUND—									
171,235	As at December 31, 1931				158,186	14	9			
	SHOW FUND—									
3,297	Loss on Southampton Show	7,802	7	3						
3,500	Less : contribution from Ordinary Account	8,500	0	0						
(Add)203					4,802	7	3			
171,438					158,884	7	6			
296	Life Compositions received in 1932				205	0	0			
151	Donations towards the Society's Funds				108	14	5			
135	Subscriptions for 1932 received in 1931				147	15	0			
—	Bonus on Conversion of 5% War Stock				152	18	11			
1,653	Excess of ordinary receipts over payments for the year 1932				256	0	9			
173,673					154,702	16	7			
(Less)										
14,972	Add : Appreciation in market values of Investments				48,244	4	3			
158,701					197,947	0	10			
18	Less : Balance of Grant to Cambridge University re Rockefeller Foundation				—					
158,683					197,947	0	10			
99	Less Adjustment in respect of outstanding Assets and Liabilities				283	14	10			
158,584					197,713	6	0			
	DEPRECIATION written off, viz. :—									
11	Fixtures				9	17	6			
24	Furniture				29	16	5			
312	Show Plant				800	9	1			
100	Lease of 16 Bedford Square				100	0	0			
447					440	3	0			
158,137					197,273	3	0			
	NOTE—There are commitments in respect of Contracts entered into in connection with the forthcoming Show.									
£160,538					£199,196	3	7			

T. B. TURNER,
Secretary.

SOCIETY OF ENGLAND.

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DECEMBER 31, 1932.

Cr.

Figures for 1931. £		£	s.	d.	£	s.	d.
	By RESERVE FUND—						
114,024	154,009½ 4s. 11d. Conversion Loan 3½ per cent. (1961) @ 99*	153,063	3	1			
733	787½ 4s. 7d. Conversion Loan 4½ per cent. (1940-44) @ 109½*	840	2	3			
2,385	8,909½ 18s. Local Loans 3 per cent. (1912) @ 87*	3,401	10	6			
2,358	2,840½ 18s. 6d. Metropolitan 3 per cent. Consolidated Stock (1941) @ 100*	2,840	18	6			
5,386	6,528½ 1s. 6d. Canadian 4 per cent. Stock (1940-1960) @ 104*	6,789	4	0			
14,683	15,294½ 18s. 2d. War Loan 3½ per cent. (1952) @ 98½*	15,103	9	6			
4,975	5,000½ Conversion Loan 5 per cent. (1944-1964) @ 115*	5,750	0	0			
144,544	* Market value at December 31, 1932.				187,788	2	10
	By OTHER INVESTMENT—						
—	2,724½ 11s. 7d. Metropolitan Water 3 per cent. (E) Stock (1958-1978) at cost				2,500	0	0
	By LEASE OF 16 BEDFORD SQUARE	500	0	0			
500	Less Amount written off in 1932	100	0	0	400	0	0
	By FIXTURES, FITTINGS, etc.—						
	As at December 31, 1931	181	18	0			
132	Less Depreciation at 7½ per cent.	9	17	6	121	16	6
	By FURNITURE—						
	As at December 31, 1931	298	8	10			
	Less Depreciation at 10 per cent.	29	16	5			
298	Added during year	268	7	5	801	17	5
1,500	By PICTURES (500£) and BOOKS (1,000£)				1,500	0	0
	By SHOW PLANT—						
	As at December 31, 1931	3,004	11	8			
	Less Depreciation at 10 per cent.	800	9	1			
3,005	Added during year	2,704	2	2	2,729	2	2
1,602	By EXPENDITURE (less amounts received) on DERBY SHOW				1,076	3	9
474	By SUNDRY DEBTORS				399	12	3
72	By RATES PAID IN ADVANCE AND INCOME TAX RECOVERABLE				77	4	6
	By CASH AT BANKERS AND IN HAND—						
	ORDINARY ACCOUNT—						
900	Reserve Fund Account	4	0	0			
1,979	Current Account	2,150	6	5			
6,000	Deposit Account						
154	Petty Cash at Bank and in Hand	185	1	6			
8,433	Less SHOW ACCOUNT—Overdrawn	2,839	7	11	2,802	5	2
22		87	2	9			
8,411							
£150,538					£189,196	3	7

Examined, audited and found correct,

8 FREDERICK'S PLACE,
OLD JEWRY, LONDON, E.C.2.
17th February, 1933.

PRICE, WATERHOUSE & CO.,
Chartered Accountants,
Accountants & Auditors.

STATEMENTS OF FUNDS HELD BY THE SOCIETY IN TRUST OR WHICH ARE NOT CONSIDERED AVAILABLE FOR GENERAL PURPOSES, DECEMBER 31, 1932.

E. H. HILLS' BEQUEST.

To amount bequeathed for Pot-culture Experiments	£	s.	d.			
Less: Depreciation of Consols at	£	s.	d.	9,000	0	0
time of conversion	3,582	7	11			
Cost of conversion	134	14	7			
				3,717	2	6
				<hr/>		
				5,282	17	6
				333	4	4
				<hr/>		
To surplus on sale of 5% War Loan Stock				£5,616	1	10
				<hr/>		
				£5,616	1	10

QUEEN VICTORIA GIFTS FUND.

To Fund invested (the income from this Fund is used to make Annual Grants to unsuccessful applicants for pension through the Royal Agricultural Benevolent Institution)	£	s.	d.
Undistributed Income	5,000	0	0
	72	0	9
	<hr/>		
	£5,072	0	9

By Investments in names of Trustees: at cost:	£	s.	d.
1,000 <i>l.</i> Dominion of Canada 3% Inscribed Stock	1,062	14	0
1,000 <i>l.</i> Victorian Government 5% Inscribed Stock 1932-1942	1,070	4	4
1,000 <i>l.</i> New South Wales Government 5% Inscribed Stock, 1935-1955	1,095	5	6
1,000 <i>l.</i> London Midland & Scottish Railway Consolidated 4% Guaranteed Stock	1,556	15	9
190 <i>l.</i> 4 <i>s.</i> 6 <i>d.</i> 2½% Consols	215	0	5
	<hr/>		
By Cash at Bank, December 31, 1932	5,000	0	0
	72	0	9
	<hr/>		
	£5,072	0	9

The market values of the Stocks on December 31, 1932, amounted to £3,905 15s. 4d.

STATEMENT OF FUNDS HELD BY THE SOCIETY IN TRUST—continued.

GILBEY FUND.

To Amount provided by the late Sir Walter Gilbey for endowment of Lectureship at Cambridge University	£	s.	d.	By Investment at cost:—	£	s.	d.
Accumulation of Interest	1,000	0	0	1,457 <i>l.</i> 5 <i>s.</i> 2 <i>d.</i> Metropolitan Water "A" Stock	1,204	10	4
	204	10	4	(<i>Value on December 31, 1932, at 88=£1,282 7<i>s.</i> 9<i>d.</i></i>)			

£1,204 10 4

SUPERANNUATION AND INSURANCE FUND.

To amount set aside in accordance with declaration of Trust of July 26, 1911	£	s.	d.	By Investments in names of Trustees, at cost:—	£	s.	d.
Less: Depreciation of Consols at time of conversion	9,171	5	0	8,939 <i>l.</i> 11 <i>s.</i> 3¼% War Loan Stock (1932)	8,363	19	10
" Cost of conversion	1,837	18	4	(converted from 5% Stock, July 1932.)	559	17	4
	256	3	0	728 <i>l.</i> 2 <i>s.</i> 4 <i>d.</i> West Australian 3¼% Stock (1935-1955)	467	2	3
	2,084	1	4	640 <i>l.</i> 5 <i>s.</i> 9 <i>d.</i> Queensland 3¼% Stock (1950-1970)	9,390	19	5

513 8 2

By Cash at Bank, December 31, 1932 7,077 3 8
(Note—The market values of the Stocks on Dec. 31, 1932, amounted to £10,073 16*s.* 10*d.*)

Add: Purchase of 1,367*l.* 14*s.* 9*d.* 5% War Loan Stock at cost 1,167 0 0

Accumulation to Dec. 31, 1931 8,244 3 8
Income for 1932 1,398 15 9
Bonus on conversion of War Stock 490 1 4

Less: Premiums paid, Income Tax and share of pension 579 9 2
431 14 9

Income Tax on War Stock Interest 147 14 5

1,546 10 2
113 13 9
£9,904 7 7

"MERCHANTS OF THE STAPLE OF ENGLAND" FUND.

By Investment at cost:—	£	s.	d.
503 <i>l.</i> 1 <i>s.</i> 9 <i>d.</i> New South Wales Government 5% Inscribed Stock, 1935-55	500	0	0
(Value on Dec. 31, 1932, at 101=£508 2 <i>s.</i> 4 <i>d.</i>)			

Examined, audited and found correct,
PRICE, WATERHOUSE & CO.,
Chartered Accountants,
Accountants & Auditors.

8 FREDERICK'S PLACE,
OLD LIVERY, LONDON, E.C.2.
17th February, 1933.

Royal Agricultural Society of England.

RESEARCH COMMITTEE.

RECEIPTS AND PAYMENTS FOR YEAR 1932.

RECEIPTS.			PAYMENTS.		
	£	s. d.		£	s. d.
To Grant from General Account	1,483	10 4	By Grants to Research Institute in Animal Pathology, Royal Veterinary College, for Research <i>re</i> Mastitis in Cows	300	0 0
" Sales of copies of <i>Agricultural Research</i>	20	18 3	" Grants to Rothamsted Experimental Station for Lucerne Seed Inoculation Experiments	50	0 0
" Advertisements in <i>Agricultural Research</i> in 1930	43	16 9	" Grants to Rothamsted Experimental Station <i>re</i> collating Woburn Farm data	250	0 0
			" Grant to Norfolk Agricultural Station for Sugar Beet-Top Feeding Trials	300	0 0
			" Grant to Hampshire County Council Education Committee for Experiments in Hampshire	40	0 0
			" Medal and Grant for Essayist	11	13 6
			" Editing, etc.	20	0 0
			" <i>Farmers' Guide to Agricultural Research</i> in 1931 :—		
			£	s.	d.
			Printing and Binding	146	6 6
			Honoraria to Contributors and Editor	380	0 0
			Postage	35	16 5
			Miscellaneous	11	6 9
			" Miscellaneous Expenses	573	9 8
				3	2 2
				£1,548	5 4

3 FREDERICK'S PLACE,
OLD JEWRY, LONDON, E.C.2
17th February, 1933.

Examined, audited and found correct,
PRICE, WATERHOUSE & Co.,
Chartered Accountants,
Accountants & Auditors.

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Minutes of the Council.

WEDNESDAY, FEBRUARY 3, 1932.

LORD MILDMAK OF FLETE (President) in the Chair.

The PRESIDENT said that as the present was the first occasion on which he had presided over the Council he would like to thank the members once more for the very great honour they had done him in electing him President of the Society; and in particular he wished to thank them for their promise to help him during his year of office. More than any of his predecessors would he require that help, and he was most grateful to them for their willingness to give it.

Before proceeding to the formal business, the PRESIDENT said it was his sad duty to refer to the great loss the Society had sustained by the death of Mr. George Rea. Mr. Rea had represented Northumberland on the Council from 1905 onwards. He had served on the Chemical Committee, on the Stock Prizes Committee, on the Judges' Selection Committee and on the Showyard Works Committee of the Society. It was, perhaps, on the Stock Prizes Committee that his services were most valuable, because he had a very intimate knowledge of all the North Country breeds of stock and of the particular gentlemen most qualified to judge that stock at the various shows of the Society. He knew how invaluable was Mr. Rea's assistance to Lord Daresbury when Honorary Director of the Shows at Newcastle-on-Tyne in 1908 and 1923 and at Darlington in 1920.

It would be remembered that Mr. Rea attended the last meeting of the Council in December, and in addressing the Council was most anxious to cope with the difficulties which might arise in connection with a grant from the Research Committee to the Agricultural Research Council. In so doing, he showed what a genuine interest he took in the proceedings of the Council and how keenly he followed its debates, and also how his extensive knowledge was always at the disposal of the Society.

It would be out of place for him to sum up the public work which Mr. Rea had done, both nationally and for his own county and parochially, but apart from his services to the Society he was a keen, practical and up-to-date farmer. He had a most charming personality, so that he compelled immediate respect and regard for his sound views and his commonsense attitude on all questions. He was a typical Northumbrian, and the Society was the poorer for the loss of one who had served it so faithfully and so well for a great number of years.

The Council had also to deplore the loss of Sir Howard Frank, who, although not a member of Council at the time of his death, continued to take a great interest in the work of the Society. He had been a member of the Council, and had represented London from 1907 to 1921. It was a matter of great regret to Sir Howard Frank that the many public duties he was called upon to undertake left him so little time to devote to the work of the Council. Personally, he knew that Sir Howard was extremely disappointed when he had to sever his connection with the Council in 1921, but he then became a Governor and still continued his active interest in the Royal Show. He frequently attended the meetings of the Council as a Governor, and he, too, was present at the last meeting in December.

The Council had also to express its sympathy with Colonel Stanyforth and Mr. Burke in the loss they had sustained by reason of the death of Mr. Hubert J.

Greenwood, Colonel Stanyforth's brother and a cousin of Mr. Burke. Mr. Hubert Greenwood had a long connection with the Society and was brought closely in touch with the financial side of its work. He was a member of the Society for very many years, and acted as one of the Elective Auditors from 1902 to 1925. In July, 1926, he was elected an Honorary Life Governor for his services as auditor. Mr. Greenwood seldom missed a Royal Show, and was particularly interested in the breeding of Shorthorn cattle. He often, too, attended the meetings of the Council as a Governor, and followed its proceedings with the very greatest interest.

He was sure it would be the wish of the members to testify their sincere sympathy with Mrs. Rea, Lady Frank, and, in the case of Mr. Greenwood, with Colonel Stanyforth and Mr. Burke, and he would ask those present to signify in the usual way by standing in their places.

The members of the Council stood in silence.

Colonel STANYFORTH, on his own behalf and on behalf of his relations, expressed to the President and to the Council his very great thanks for their kind sympathy in the loss of his brother.

Twenty-one new members were elected.

In presenting the Report of the FINANCE Committee, Mr. ADEANE said it was always disagreeable to ask people to economise, and the Committee much regretted that they were obliged to ask the Scientific Committees to review their expenditure. The justification for that, however, would be seen at once if he gave the Council a few figures. In 1925 the membership was 13,573; at the present time, 1932, it was only 9,916, so that in those seven years there had been a loss of 3,657. It would be quite reasonable to regard those members as worth £1 each per annum, and therefore the Council could see how serious the loss of revenue had been. There was no need for alarm, but the time had come seriously to study economy and also to make every effort possible to maintain the membership of the Society. He appealed to members of the Council to do what they could in that respect.

Sir ARTHUR HAZLERIGG, in moving the adoption of the HORTICULTURAL Committee's Report, felt sure the Chairman of the Finance Committee would be pleased that the Horticultural Committee had cut out two classes, thereby doing something towards economy in prizes. The Committee went carefully into the matter of the tents, in view of the fact that Mr. Borlase Matthews and others said that the tents at the Hanover Show were much better than those used by the Society. The Committee had before them estimates with photographs and pictures, and found that all the other estimates were double or treble those for the present tents. They had, however, arranged for something to be done to improve the ventilation, which he hoped would help perspiring crowds on a hot day in Southampton.

Sir MERRIK BURRELL, in moving the adoption of the Report of the VETERINARY Committee, thought the following figures with regard to foot-and-mouth disease would be of interest to the Council:—In Great Britain in 1931 there were 97 outbreaks. In France, up to December 15th last, there were 10,528; in Germany, up to December 15th last, there were 24,180; in Holland, up to November 30th last, there were 11,707; and in Belgium, up to the end of last November, there were 589.

The only other comment he wished to make on the report concerned the report of the Warble Fly Committee. The Council would shortly have seriously to consider whether it would support the policy of compulsory dressing of cattle for warble fly. He thought the Warble Fly Committee had proved conclusively that the derris root wash was both cheap and efficient. With the very large volume of Irish cattle now coming over, it looked as if it was going to be difficult to eradicate the fly, and no doubt it could not be done without compulsory action. He did not think the moment had arrived yet, but he hoped members of Council would keep the point in mind, because the necessity might arise before very long.

In moving the adoption of the IMPLEMENT Committee's Report, Colonel STANYFORTH said the Secretary's visit to the Paris Agricultural Machinery Exhibition had been very useful, and the Society had been able to obtain some

useful ideas as a result. He hoped the Council would agree to a letter of thanks being sent to those people who were extremely kind and courteous to Mr. Turner and helped to make his visit as interesting as possible.

The PRESIDENT said the Secretary had compiled a most interesting report of his experiences abroad, and had gathered a great deal of useful information. The Council would, he was sure, agree it was advisable that the authorities in France should be thanked for their courtesy.

The PRESIDENT said the Council had learned, with the greatest pleasure, that Their Royal Highnesses the Duke and Duchess of York contemplated visiting the Show in July next. Their Royal Highnesses were extraordinarily popular throughout the country, and their visit would be warmly welcomed, not only by the inhabitants of Southampton and district, but by British agriculturists from all parts of England.

In December he received from Sir Frederick Ponsonby an intimation on behalf of His Majesty the King that he had given instructions that nothing must be done which would in any way interfere with the showing of his sheep and cattle at the Royal Show. He thought that was most satisfactory.

The DAIRY AND PRODUCE Committee's Report having been presented, Sir ARCHIBALD WEIGALL said he wished to ask the Council for its instructions. Since the meeting of the Committee the previous day, he had received from the Empire Dairy Council, on which he sat as representing the Council of the Society and the National Cattle Breeders' Association, a letter to the effect that they had been informed that the Government were considering how far dairy and allied products could be brought within any alteration of our fiscal system, and asking whether the Council of the Society had any advice or assistance to offer and whether it would be prepared to answer a questionnaire which was being sent to all the constituent bodies for the assistance and guidance of Parliament.

He realised, of course, that a very difficult question was involved. On the last occasion when he was at a meeting of the Empire Dairy Council he moved a resolution, but did so as an individual, and of the three resolutions of that Council which were referred to in the Report one was innocuous and on the other two he had voted as an individual. The question raised in the letter to which he had referred, however, was a very much bigger one. There were in fact five questions:—

- (1) Are you in favour of an import tax on dairy produce?
- (2) If you are in favour, how do you suggest it should be carried out?
- (3) Do you favour total exemption of Empire products, or
- (4) Preferential treatment within the Empire, or
- (5) Do you want to postpone action altogether until after the Ottawa Conference?

The difficulty he was in was this: over a year ago he foresaw that something of this kind might arise, not only in connection with dairy produce, but with regard to the whole question of primary production in this country, and he was then told the Charter of the Society prevented the discussion of the matter. His answer was that he was a member of the Council of the Land Agents' Society, which was also a body with a Royal Charter, but that Society had a Parliamentary Committee, to which such questions were referred.

He would like to know whether he was to answer the letter from the Empire Dairy Council by saying that the premier Agricultural Society in England considered dairy production and the whole future of it, not only in this country but in the Empire, to be so trivial a matter that it could not give any reply at all, or should he say that it was prepared to give such advice and assistance to the legislature of the country as lay in its power. It was not possible to get out of the difficulty by saying, "You can answer this as an individual."

The SECRETARY pointed out that Sir Archibald was mistaken in thinking he represented the Royal Agricultural Society on the Empire Dairy Council. Sir Archibald might represent the National Cattle Breeders' Association, but the Society was represented by Mr. William Burdett, with himself as deputy. He had that morning received a letter in similar terms from the Empire Dairy Council.

Sir ARCHIBALD WEIGALL apologised, and explained that the mistake arose because he had given evidence before the Empire Dairy Council on behalf of the Society. However, the fact that the Secretary had received a letter made the matter worse, because the Secretary was a much more important individual than a humble member of Council like himself. The fact remained that an answer had to be sent, and he would like to know what answer the Council proposed to send.

Mr. ADEANE said that if the Council were to pronounce directly on the question Sir Archibald Weigall had raised, it would be going beyond its Charter. If a poll were to be taken of those attending the Council meeting that day, probably almost 100 per cent. would be in favour of some import duty; but, considering that there was a division of opinion in the country on such questions, and especially at the present time, when even the National Government was not united in regard to them, he thought it would be very dangerous for the Society to express an opinion. He thought it would be better for the letter which had been received to lie on the table.

Sir ARCHIBALD WEIGALL did not think such a course should be adopted merely because there was a division of opinion in the country. The Society surely had an opinion on the vital question raised, and it should not run away and refrain from expressing it. He hated the idea of the Society being accused of cowardice, but that was the charge which would be made against it.

The SECRETARY recalled that at the meeting when the Empire Dairy Council was formed he was present as representing the Royal Agricultural Society, as deputy for Mr. Burkitt, and he made it very clear, when the memorandum of suggestions of what that Council might do was discussed, that the Society could not take part in anything of a political nature, and that as soon as anything connected with politics was introduced it would have to fall out. That was agreed to.

Sir ARCHIBALD WEIGALL agreed.

The Rev. C. H. BROCKLEBANK said if he were in order he would like to move that the Council do answer the letter and take the chance of what happened afterwards.

The PRESIDENT said the question was obviously a very difficult one, in view of the traditions of the Society, and very great care must be taken not to interfere in matters which were likely to be the subject of violent controversy in the House of Commons in the near future. That seemed to him to be the danger.

He was merely giving his own opinion, and did not wish to press it, but it seemed to him that in any case the Council could express no view without first investigating the matter and giving it a very great deal of consideration before embarking on so serious a step.

Sir ARCHIBALD WEIGALL asked if it would help if the matter were referred to an *ad hoc* body composed of members of the Council who were or had been members of the House of Commons, or at any rate to a body of which they formed the nucleus, since they were probably better able to appreciate the parliamentary difficulties than other members.

The SECRETARY, at the President's request, read clause 4 of the Charter :—

4. And know ye further, that in granting this our Royal Charter to the said Royal Agricultural Society of England, we do hereby declare it to be our full and entire will and pleasure that we extend our Royal protection to its national objects, under the condition that a principle of its constitution shall be the total exclusion of all questions at its meetings, or in its proceedings, of a political tendency, or having reference to measures pending, or to be brought forward, in either of our Houses of Parliament, which no resolution, bye-law, or other enactment of the said body politic and corporate shall on any account or pretence whatever be at any time allowed to infringe.

Colonel STANYFORTH said that on previous occasions he had referred to the fact that the Charter seemed to make the Society an extraordinarily useless body, and he had advocated some alteration being made in it, and that there should be some definition of what was political and what was not. At the present time the Government naturally wished for the advice of the various agricultural societies, yet the Royal Agricultural Society, the premier Society, would have to answer,

according to the letter of the Charter, that it would not give any advice at all. That was an absurd position for it to be in, and the sooner some alteration was made the better, because in its present form the Charter made the Society practically useless when any really vital question arose.

He agreed that the question raised was of such importance that it would be impossible to give an answer that day, and thought Sir Archibald's suggestion of an *ad hoc* Committee would meet the difficulty; but he hoped such a Committee would not be immediately coerced into feeling that they could not give an answer and could not do anything on account of the Charter. He believed there were certain ways out of the Charter, and would be prepared even to adopt Mr. Brooklebank's suggestion of giving an answer and seeing what happened afterwards. There was an element of danger in doing that without first having a thorough investigation of the matter by a Committee, but he hoped in some way it would be found possible to give an answer to the Government.

Sir MERRIK BURRELL suggested that the *ad hoc* Committee, if set up, should be empowered to take counsel's opinion on the present position of the Society and the proper steps to take to alter the Charter, if it was thought desirable to do so. He did not agree with Sir Archibald Weigall that if the Society were unable to take any action at the present juncture it would amount to running away; it would simply be that they were unable to take part in the fight, which was a different thing. He was entirely in favour of setting up a Committee, so long as they had power to take legal opinion; the matter was too serious for lay opinion to decide.

The SECRETARY said legal opinion regarding the Charter had already been taken.

Sir ARCHIBALD WEIGALL then moved:—

"That the inquiry and questionnaire forwarded to the Council by the Empire Dairy Council be referred to an *ad hoc* Committee, with instructions to inquire and report."

The Rev. C. H. BROCKLEBANK seconded the motion.

The PRESIDENT asked what proposal Sir Archibald made with regard to personnel.

Sir ARCHIBALD WEIGALL thought the Selection Committee could find the personnel themselves. That might be left to the Selection Committee. The proposed Committee would report to the Council, and, if necessary, there might be included in its terms of reference the whole question of so altering the Charter as to make the Society a useful, and not a useless, body.

Mr. ADAMS said that at present the Society seemed to be bound by its Charter, on which it had had counsel's opinion on more than one occasion. That, he thought, must be the immediate answer. It was not that the Society was running away, but that it was bound by its Charter.

Sir ARCHIBALD WEIGALL said he wanted to bring the Society into line with the Land Agents' Society, which was a purely non-political body with a Royal Charter, and which was yet able to give assistance to the Government, and had done so for the last three years in regard to every measure affecting the land. The Society should have the same clause in its Charter as the Land Agents had in theirs, and then it could be useful to the Government.

The motion moved by Sir ARCHIBALD WEIGALL was then put by the PRESIDENT and carried.

The PRESIDENT asked whether the suggestion was that the personnel should be chosen by the Selection and General Purpose Committee at its meeting in March.

Sir MERRIK BURRELL thought that would cause undue delay, and suggested the present Selection Committee, if given power to co-opt, would fill the purpose very well.

The Rev. C. H. BROCKLEBANK thought Sir Archibald's proposal, that it should consist of Members of Parliament who were also members of the Council, would meet the case. It might consist of Members of both Houses who were also members of the Council.

Sir MERRIK BURRELL said he would rather object to that, as he would prefer to have people who had not decided political views. If the Selection Committee were given power to deal with the matter, and could co-opt anyone they thought would be specially useful, that should be satisfactory.

The PRESIDENT hoped Sir Merrik's suggestion would commend itself to the meeting.

The suggestion was agreed to.

Sir MERRIK BURRELL moved the adoption of the Report of the RESEARCH Committee. They had, he said, considered from every point of view how they could reduce their expenditure, and had managed to reduce by 20 per cent. the grant for which they usually asked. They did so only with deep regret and at the cost of giving up work which they would have liked to put in hand; when better times came, as everyone hoped they would, he trusted the reduction in the grant would not be continued. The Committee had always tried, and would always try, to meet Mr. Adeane's calls on them, but he hoped it would not be thought that it had been possible to make the reductions which had been effected without giving up work which it was desirable to undertake.

WEDNESDAY, MARCH 2, 1932.

LORD MILDMAY OF FLETE (President) in the Chair.

Before proceeding to formal business, the PRESIDENT announced, with very great regret, the death of two gentlemen since the last meeting, both of whom had been closely identified in the past with the work of the Society. Sir William Somerville was Sibthorpean Professor of Rural Economy at Oxford University for a great number of years. He was also one of the first Nominated Members of the Council of the Society, being elected with Sir William Dampier in 1921. He then served upon the Research Committee, and his wide knowledge of scientific agricultural problems materially helped that Committee in the early stages of its existence to arrive at a scheme of work and investigation. He was interested in grassland problems, and placed a portion of his farm at the disposal of the Society for the purpose of conducting experiments. He retired from the Council and the Research Committee in November, 1926, owing to failing health, and at the same time relinquished his professorial chair at the University of Oxford.

Dr. Stenhouse Williams, although not a member of the Council, was a co-opted member of the Dairy and Produce Committee. He had spent a lifetime in the study of dairying problems and milk production, and occupied the position of Director of the Institute for Research in Dairying at Reading up to the time of his death. Possibly no man ever took a keener interest in the production of clean milk than Dr. Stenhouse Williams, and he probably did more to encourage clean milk production than any other man of his time. His services were always ungrudgingly given to the Society and to the Dairy Committee on any subject on which he was able to give information.

He was sure the Council would desire an expression of their regret at the loss they had sustained, coupled with their sympathy, to be conveyed to Lady Somerville and Mrs. Stenhouse Williams, and he would ask those present to give their assent to that in the usual way by rising in their places.

The members of the Council stood in silence.

Mr. Emile E. Soubry was elected a Governor, and 25 new members were admitted into the Society.

Sir MERRIK BURRELL, in moving the adoption of the Report of the VETERINARY Committee, said that he had nothing to add, but possibly Lord Radnor, who was the Chairman of the Pig Industry Council, might wish to make some remarks.

The Earl of RADNOR said that he did not know what Sir Merrik wanted him to say on the subject of the pig. The Pig Industry Council was meeting the

Minister on Friday, and hoped to get from him what were the exact requirements of the Ministry in the way of organisation. The Pig Industry Council sent to the Minister some time ago a report on veterinary subjects, which was published, he thought, in the *Ministry Journal*. The Pig Industry Council was acquainted with all the questions relating to swine fever and so on raised in the report now under discussion. Their information was that swine fever inoculation had by no means proved to be efficient. In that, as in many other cases, it seemed that popular imagination in America had gone beyond scientific proof, and the American had seized on inoculation as a means of dealing with swine fever before the scientist had succeeded in achieving the object he had in view. The difficulty of the position, therefore, was very much more than merely producing the serum used in America, because, as he had pointed out, that method had not proved its efficiency. In regard to other diseases, they knew that this country was extremely behindhand in its methods of dealing with diseases and its methods of research. In fact, one might say confidently that there was virtually no research at all into pig diseases.

He noticed a statement in the report before them that the Ministry stated that many cases of swine fever proved on investigation not to be swine fever, but some other disease. The Ministry did not specify the disease, and, as he suggested, did not know what that other disease was, and were taking no steps to find out. The Ministry's veterinary organisation dealt with the investigation of diseases under the Diseases of Animals Acts, and very largely with swine fever, and 50 per cent. of the cases or thereabouts proved not to be swine fever. The unfortunate man whose pigs were ill was told if they were suffering from swine fever, but if it was not swine fever he was not told; in fact, he got no further information at all. That seemed to him to be extremely bad organisation. However, he had promised to give a copy of the report of the Pig Industry Council to the Chairman of the Veterinary Committee, who would no doubt pass it on to the Agricultural Research Council.

Sir WILLIAM DAMPIER stated that the newly formed Agricultural Research Council, in carrying out its survey of the agricultural research going on in the country at the present time, felt that the most urgent subject and that which would lead to more direct benefit to agriculture than anything else was research into animal diseases. That Council thought that less was going on in that direction than in a great many other departments, and was going to make every effort to urge that work on. The Agricultural Research Council had been round some of the Institutes concerned with pathological research, and he was not sure that the information then acquired agreed with what Lord Radnor had said about inoculation for swine fever. One of the research workers whom they saw had recently been in America, and distinctly said that the method had proved in general a success. Evidently there was some conflict of evidence.

LORD RADNOR explained that perhaps his information might be a little out of date. He was speaking of eighteen months ago.

Sir WILLIAM DAMPIER thought it was quite true to say that at present little was known of the mysterious disease which was sometimes confused with swine fever. That was one of the things which the research into animal diseases had to find out; but, if he were to recount all the things which research into animal diseases had to find out, he would be speaking all the morning.

THE PRESIDENT was sure the Council would agree that, in view of the remarks made by Lord Radnor, Sir William Dampier and the Chairman of the Veterinary Committee, further research, particularly in the direction of swine fever, was most necessary, having regard to the difficulty of diagnosing the certain existence of swine fever. He thought they were all greatly gratified to hear from Sir William Dampier that the Agricultural Research Council was fully convinced of the necessity for research in that direction and intended to push it as far as possible.

Mr. BURKE, in moving the adoption of the Report of the SHOWYARD WORKS Committee, said the recommendation contained therein that the County Police should be employed this year instead of the Metropolitan Police would not only mean a saving of between £500 and £600, but would give very great satisfaction in the county.

In the absence of Lord Daresbury, Lord CORNWALLIS presented the Report of the SELECTION AND GENERAL PURPOSES Committee. He stated that the Selection Committee met on Monday. A numerously attended meeting gave full and prolonged consideration to the matter referred to them at the last Council meeting, and came, as a result, to the conclusion that it was impossible for the Council to take a direct part in the consideration of Bills occupying the attention of Parliament or to find any *via media* giving them fuller powers in that direction without altering the Charter. It was unanimously agreed that the disadvantages of altering the Charter were so great that the Committee had no option but to make the Report which was before the Council.

Sir ARCHIBALD WEIGALL assured the Selection Committee of his heartfelt gratitude at the enormous forbearance and patience with which they had listened to him during a lengthy discussion. Thinking of it afterwards, he was bound to say that, had he been in their position, he, with his impulsive nature, could not have sat it out. He felt, however, enormously grateful. He would like to assure the Council that, such was the cogency of the arguments advanced at the meeting by men whose experience of the Council was far longer than his own, that he was bound reluctantly to bow to their decision, convinced that it was the one that presented, at any rate, the least number of disadvantages. He hoped the Council would accept that decision with no diminished determination to help agriculture, within the traditional limits of the Charter, in the increased opportunities that now lay at their door.

The Rev. C. H. BROCKLEBANK reminded the Council that during the war they had a War Emergency Committee, which was in touch with the Government and did a very great deal of good work. Might not the Selection Committee consider whether such an Emergency Committee could be appointed to act as a kind of liaison between the authorities of the day and this Council? He felt sure that no member of the Council wished to take part in political affairs as such, but so many things cropped up now that were of great interest to agriculture, and it was very difficult to define what was political and what was not. During the war he happened to be President of the Shorthorn Society, and the authorities made them sell their hay and plough up their grass, and there was always a good deal of trouble. He was at Hanover Square almost every day then, and was often asked: "Cannot you do anything to help me? I am ordered to plough up my best fifty acres of grass." That was referred to the War Emergency Committee, and, as far as his memory went, that committee gave a great deal of help on many occasions. He thought it would be very helpful if a committee of that sort were set up to be a liaison between the Society and the authorities of the day.

Lord RADNOR was prepared—and he thought most members of the Council were—to accept the decision of the Selection Committee as being wise. But, not knowing all the circumstances, he regretted the Committee's inability to recommend any means whereby the Society could co-operate with the Government in future legislation. There was a very distinct movement in Departmental circles to consult industry on pending legislation. Some members of the Council were aware of the enormous amount of consultation that took place with various branches of the industry over the Wheat Quota Bill. Sir John Gilmour had referred in his speech on the previous evening to negotiations lasting since October. It certainly seemed a pity that the Society, representative as it was of a very large and important body of agricultural opinion, should be entirely debarred from any means of giving its advice to the Government of the day on pending legislation. He understood that it was impossible under the Charter.

Lord CORNWALLIS stated that the Committee were fully alive to the considerations mentioned by Lord Radnor and Mr. Brocklebank; but, in spite of the weight attaching to those considerations, the Committee felt compelled to make the recommendation that was before the meeting.

Mr. ADEANE said that he had had the honour of being Chairman of the War Emergency Committee and was glad to hear that it had done good work, but that was at a time when there were really no party politics at all. It was an exceptional time, a time of war. The Society was appealed to by the Food Controller to give

him assistance, and that really led to the formation of the War Emergency Committee. He thought there was no analogy between a time of war and the present, and therefore he could hardly see how a similar Committee could be formed.

The PRESIDENT pointed out that the Committee to which Mr. Brooklebank referred was in the nature of a war-time Committee. He thought it would be very difficult to induce the Government to agree to such a Committee at the present time. Things were very difficult during the war, and the Government was practically a despotism. The meeting of the Committee that considered the question at issue was very largely attended by many of the most influential members of the Council, who devoted a very great deal of time to considering the question from every point of view. They quite saw the weight which attached to the representations made to them, but they recognised, and finally decided, as had been said, that it would not be advisable to alter the Charter, and that there would be very great difficulty in doing so. In those circumstances he hoped that view might prevail.

In presenting the DAIRY AND PRODUCE Committee's Report, Mr. BURKITT said that two words would have satisfied him and everybody else, he expected, in moving its adoption, but for the first paragraph in it. The President had referred to the death of Sir William Somerville and Dr. Stenhouse Williams. His Committee had also wished to make some reference to it. The President's opening remarks had affected him personally very considerably, because he was one of the first students of Sir William Somerville, and as long as he lived he would never cease to be grateful to him for his teaching and interest. He would like to say a word also about Dr. Stenhouse Williams. He believed that Dr. Stenhouse Williams first came in touch with the Royal Agricultural Society when he acted as bacteriologist at the Milking Machine Trials held at his (the speaker's) home at Bishop Auckland in 1913, and he had ever since been in closest touch with the Society. Personally, he ventured to predict that, when the history of dairying in this country came to be written, no one would receive greater credit for the advance in dairying than Dr. Stenhouse Williams for the long battle he had waged against dirt and disease. One thing Dr. Williams did was to fight for a clean milk as apart from a dirty milk cleaned, which seemed to be a doctrine almost universally preached throughout the world at the moment. Dr. Williams stood out for keeping the milk clean from the beginning rather than having it pasteurised afterwards and made clean. There was a little more to be said about Dr. Williams. He was a quiet man with a sense of humour, which carried him through. One great thing about him was that, although he was a scientist to the soles of his feet, he possessed the happy knack of being able to get on with practical farmers, which was often the great difficulty in the alliance of science and practice in the agricultural profession. He had lost, as many members had, a good, kind friend.

Other business having been transacted, the Council adjourned until Wednesday, April 6th, 1932, at 11 a.m.

WEDNESDAY, APRIL 6, 1932.

LORD MILDMAI OF FLETH (President) in the Chair.

Thirty-two new members were elected.

Mr. BURKE said the SHOWYARD WORKS Committee would bear in mind a suggestion by Mr. BORLASE MATTHEWS that enquiry should be made regarding the possibility of the provision of seats in the Southampton showyard by a contractor.

The Report of the SELECTION AND GENERAL PURPOSES Committee was presented, including a recommendation for the acceptance of a cordial invitation to the Society from the Town Council of Ipswich to hold the Show there in 1934.

Mr. E. C. RANSOME said the Corporation of Ipswich fully intended to do all in its power to make the Show of 1934 the success that it had been in the past.

The Corporation would do all it possibly could in arranging for the water, gas, and electricity that was necessary. The holding of the Show at Ipswich was also being favourably received by the agricultural societies of Suffolk and the adjoining counties.

Mr. FRED SMITH, speaking for Suffolk, said that the county would appreciate it very much if the Council passed the resolution and the Show visited Suffolk in 1934. Although they were going through hard times just now in Suffolk, they lived in hope, and they hoped that things might possibly have mended by 1934. He found that the Royal Agricultural Society last visited the county of Suffolk in 1867. If, as was hoped, the Show was held there again in 1934, it would be just sixty-seven years since the last visit. He hoped that the repetition of the figures 6 and 7 might be a happy omen for the Show. He could assure the Council that, with the help of the adjoining counties, Suffolk would give the Show a hearty reception.

Captain H. G. BUXTON, in the absence of Lord Hastings, wished to assure the Council how very much everyone in Norfolk welcomed the coming of the Show to East Anglia again. The Royal Norfolk Association had decided to forgo its show in 1934 and to subscribe £500 to the funds. He felt that the county of Norfolk would do exactly the same as if the Show was being held at Norwich—do their utmost to make the Show a great success. Norfolk agriculturists prayed that when the Society came to East Anglia it would find things in a little better way than they were to-day.

Sir WALTER GILBEY, on behalf of the county of Essex, said that the agriculturists in particular were very flattered that the Royal Show was to be held in the Eastern Counties in 1934. He could assure the Council that Essex farmers and agriculturists would give it a hearty welcome and do everything in their power, as the adjoining counties had promised to do. The Eastern Counties, especially Essex, were suffering from the greatest depression in agriculture, and he felt very hopeful that the mere fact of holding the Show in East Anglia would give a great fillip to agriculture in those poor counties. The Essex Society were not holding a show in 1934, but were making a grant towards the local fund. He assured the Council that the Essex Agricultural Society would give every possible support.

The PRESIDENT moved that the invitation that had come from Ipswich should be most gratefully accepted. The Council wished also to thank those gentlemen who had proffered such whole-hearted support, and he hoped very much that better times would be with them when the Show was held. He asked the Council to adopt the Report, including the acceptance of the invitation.

The motion was agreed to.

A Report was received from the QUARANTINE STATION Committee, embodying the following resolution, which was recommended for adoption by the Council:—

“That the Minister of Agriculture be requested to urge on all Dominions and Colonies who have not yet recognised our quarantine system for the export of pedigree live stock the desirability of so doing, and that opportunity be made at the Ottawa Conference for urgent representations to be made on the subject.”

Mr. JOHN EVENS moved the adoption of the report, with the exception of the resolution to be sent to the Ministry of Agriculture. He wished, in doing so, to refer to the retirement of Mr. Ritchie, who had been manager of the Quarantine Station for the four years since its opening and, the Committee considered, had filled that post with very great success. He believed the Council would wish to congratulate Mr. Ritchie on his appointment as Land Steward to His Majesty the King at Windsor.

With regard to the work of the station, it had now been open for four years, and 2,063 animals had passed through it at an expense per animal of just under 48s. The Committee thought that the carrying on of the work of the Quarantine Station had been an unqualified success. There had been, of course, a large falling off in the number of animals sent through the station during the last year, for reasons which were known to everyone present. The Society acted as managers and ran the station. It was no expense to them, nor did they make any profit.

The Committee thought that it was of great benefit to the pedigree breeders of this country in order that their overseas customers should have confidence and feel assured that the animals went to them free from disease.

The PRESIDENT felt sure that it would be generally agreed that there was every reason to be grateful to those who had been concerned in the management of the Quarantine Station and made it such a success—Sir Merrik Burrell and other members of the Council, as well as Mr. Ritchie, whom they would like to congratulate on having secured the post to which he was going.

The Report was adopted, with the exception of the latter part.

The PRESIDENT then moved the resolution appearing in the report.

Mr. JOHN EVENS, in seconding the resolution, said he could say nothing stronger in favour of it than the report the Committee had made on the past work of the Quarantine Station. The present arrangement for carrying on the station only continued for one more year. It was originally for five years, and four years had passed. Those who had had anything whatever to do with the station very strongly and sincerely hoped that it would be carried on in future, because, as had been pointed out by the President, it had been of great value to breeders in this country and had merited and received the confidence of overseas buyers.

The motion was agreed to.

Sir DOUGLAS NEWTON moved, pursuant to notice :—

“ That, with a view to promoting effective competition with imported pig products, the classes in which medals and prizes are awarded by the R.A.S.E. for pigs be restricted to four breeds.”

He said that he had tabled the motion that appeared on the order paper that day with diffidence, because he knew that some members were inclined to regard as a rather serious matter the introduction of any change in the Society's schedule of prizes and classes or anything which would interfere in any way with the well-established practice of the organisation. He had been fortified in his desire to table the resolution by the fact that Sir Archibald Weigall, who always took such an interest in the proceedings of the Council, was prepared and anxious to second it when the matter was mentioned to him. He was extremely sorry, as everyone else present would be, that Sir Archibald had suffered an operation, was on a bed of sickness and was prevented thereby from undertaking the duty.

A perusal of the prize schedule indicated that there were nine breeds for which classes were provided. The resolution suggested that those breeds should be restricted to four. He purposely avoided suggesting what those four breeds should be, although he had quite clear-cut views in his own mind upon the point, because there were others present who were far better qualified to express an authoritative opinion upon that matter than he was. He had not referred to it in the resolution, but he would also like consideration to be given to the establishment of a new class for baconers and porkers. That, he thought, would be a very valuable new class.

He felt that all was not well with the pig industry. There was a multiplicity of breeds, and the tendency was to increase the number still further. In the Board of Trade accounts for 1931, published at 3s. 6d., it would be found that the import into this country of pig products—bacon, ham, frozen pork and salted pork—amounted to £41,000,000. Of that, no less than £22,000,000 worth was exported by a country a matter of three or four hundred miles from London, namely, Denmark. What happened on the export side of the programme? The Council had listened to a eulogy of the export of live stock through the Quarantine Station and the excellent work that had been done. What had been done with regard to pigs? The country exported 833 pigs in the whole of the past twelve months, which had been worth to the British farmer only £16,164, or less than £20 per pig. That £16,000 stood, so to speak, on the credit side, the exports, as against the £41,000,000 on the other side, the imports. Therefore, it was not very much good talking about the value of the export of pigs so far as the English farmers were concerned. Indeed, it must be remembered that those exported

pigs were used for the definite purpose of breeding the animals which produced the pork which undercut that produced in the British farmer's own country. The National Pig Breeders' Association, at a very important and representative meeting on Monday, passed a very strong resolution deploring the position of the British pig industry owing to the dumping of foreign pig products, expressing alarm at the destruction of sows which was taking place in the country, and praying for the early resuscitation of the pig industry. It was a significant fact that sows were getting fewer. According to the ten years' averages shown in the returns of the Ministry of Agriculture, the sow population had fallen from 346,000 odd to 315,000 odd. There had been an actual reduction in the ten years of over 30,000 sows or 8·8 per cent. The pigs, of course, naturally followed the reduction in the number of sows and had been reduced by 206,500 or an average of 9·5 per cent. Those were very significant figures. He apologised to the Council for mentioning figures, but he thought he must do so in supporting his argument. The estimated average annual production of pig meat in the period from 1909 to 1913 was 4,981,000 cwt. In the period from 1921 to 1926 it varied from 3,857,000 cwt. to 5,126,000 cwt., which was the highest figure. In other words, pig production in this country had remained practically stationary right away from 1909. There had been no considerable change in the volume of pig production. That production had remained fairly stationary now for an even much longer period; he thought for something like sixty years. While British pig production had remained stationary, other countries had jumped in and taken the business, and the imports in 1925, which happened to be the last year for which he was able to get figures, had increased by as much as 90 per cent. The quality, too, was all right. In the recently published Orange Book it was stated that Dutch pork was generally considered to be superior to the average home-produced article. That was an official statement made after consideration. Therefore the British farmer had not only to fight the foreign pig producer, but an importation of pig meat of very high quality.

He desired to see the hands of the Royal Agricultural Society, the premier agricultural society in the world, strengthened. He thought that British pig producers ought and could and would be willing to contribute, if properly led, a greater share of the national pig food supply. In order to do that and to participate in that larger share, the British pig producer must produce pigs which were similar in character and equal in quality to those from abroad, and which would make as strong an appeal to the palates of the urban consumers in this country. It was only on condition that the quality was that which the consumer sought that he would be induced to buy home-produced pig products. It was not merely the big farmer who would be assisted by the stimulation of pig production in this country, but the smallholder and, above all, the cottager. It was not a question of how much land a man farmed and how much food he grew, because he could still produce pigs if he had to buy the food elsewhere. Such stimulation would also have the advantage of assisting dairy farming, because there was a close connection in other countries between pig producing and dairying. It also had possibilities in the utilisation of surplus milk and potatoes and in improving land for cereal crops.

He considered that the part the Society could play was perhaps the most important of all. The Government had promised to take action in regard to the regulation of imports, subject to a proviso that the agricultural house was set in order. One way of setting that house in order was to begin at the beginning and to reorganise the class of pigs produced and increase the number of pigs most required by factories at home. It had been estimated that, if the sow population was raised by 800,000, an ideal by no means impossible, employment could be found for 68,000 more men, and that the rural population would be increased (a thing which everybody admitted to be very desirable) by no less than 200,000. It had also been estimated that that increase would entail the importation of 6,000,000 tons of wheat, not to mention the demand for fish meal, which would help the nautical section of our nation. It had also been suggested that a baconer at 9s. a score would give a return on wheat and barley of 36s. a quarter. He could

not vouch for that figure, but it had been given recently by an important agricultural economist.

It was generally agreed that farmers must have an assured market and stability of price. That, he suggested, entailed the grading of pigs, and quality and uniformity. That, again, depended on the breeding and type produced. It might be urged that this was not the time for doing such a thing. With some people it never was the time to do anything. A beginning must be made. If the time when the home market was simply overwhelmed by the pig products of a country only a few hundred miles from London, was not the time to start and try to put the house in order, particularly when there was great urban sympathy with the agriculturists of this country, he did not know when the time would arrive. After those things had been dealt with, perhaps litter testing, pig recording, the prevention and control of disease, and the full development entailed in those blessed words co-operation and co-ordination could be taken in hand. Financially the advantages were great. The advantages to the agriculturist were obviously immense. The national advantages were also obvious in the matter of balancing trade, national defence and employment, and the increase in the rural population. He asked the Council to take a large view of the matter. There was and must be opposition, but as the years went by there must be change if pace was to be kept with the needs and requirements of the great community in this country.

Mr. BORLASE MATTHEWS, in seconding the motion, pointed out that the Royal was a great Society, and a great Society could undertake a great responsibility. He appreciated that it would be a great responsibility on the Society if it followed the line suggested in the resolution, but it would be giving a big lead to the farmers of the country. Farming was in a bad way in this country at present. That position could be improved by policy or by politics. Policy was the more practical method. In the motion he thought there was a policy which had a great deal of practical advantage and was, therefore, one which would be of very great value to the British farmer. The guidance of all the best men in the industry was open to them, and in that way a lead could be given to a number of smaller farmers who were not quite clear what were the best lines to follow, who were blown this way and that by the wind of local or vested interest, and would be much better advised to secure some of the business which was done abroad at present. As the mover had pointed out, certain other points would have to be dealt with, but they all formed part of the policy which he thought a great society like the Royal should undertake in doing its very best to help all the farmers of the country, irrespective of the size of their business.

Mr. OWEN WEBB regretted on this occasion having to be in opposition to his friend Sir Douglas Newton. Living as he did next door to Sir Douglas, no one knew more than he how hard Sir Douglas worked for agriculture. He was sure that the resolution had been tabled with the one idea of ventilating and having a discussion of a subject which everyone must agree was of very great importance. The attitude which the Society would have to adopt if the resolution was passed was one which would be extremely dangerous to the Society in many ways. By eliminating two-thirds of the twelve breeds of pigs which existed to-day in the country from eligibility for the Society's medals and prize-money they would be treading on the tail of a very large number of members who not only kept pigs, but sheep and cattle, and that would mean a great loss of membership. There would also be an agitation in the papers and the country against it.

Again, Sir Douglas had not mentioned which four breeds he wished to retain, and that was where the trouble would come in. So far as he knew, there were no statistics of the Smithfield and Dairy Shows' carcass competitions and bacon competitions from which to find out which were the four premier breeds. He had studied the pigs at those shows very carefully, and had watched them for several years. The mover had not mentioned any particular breed, and he did not know whether he ought to mention it, but the champion pig at Smithfield last year belonged to a breed of pigs from the eastern counties which at the moment the Ministry thought was not of sufficient quality to receive premiums

for boars. Still, that breed had produced champion pigs which were the outstanding pigs at the Show.

It was all very well to tell farmers that they were not producing the pigs that the trade required. What lead did the producer get from the trade as to what was required? He had studied the pigs in the carcass competitions, and the weights in the class of pigs suitable for bacon showed an extraordinary variation at the last Smithfield Show. There was a difference of 5 stone between the first and second prize. He did not know how the farmer who carefully studied those figures could arrive at what the trade really wanted. The weights of the prize-winners in the class of the best pig suitable for bacon were: First prize, 13 stone 4 lb.; second prize, 18 stone 4 lb.; third prize, 19 stone 2 lb.; and fourth prize, 20 stone 1 lb. The judging was done by the trade, and how could the farmer know, unless the trade definitely told him, what kind of pig would suit trade requirements? That was not the real test. After all, in talking about pig products, there was only one thing that really counted. There was no doubt that most of the pork and the by-products of the pig could be produced as well in this country as in any other part of the world, but the British producer could not compete with the foreigner in bacon. That was the point that ought to be considered more than anything else.

The winners of the Whitley Cup for the best side of bacon at the Dairy Show, as judged by the trade, gave extraordinary figures. Two years the Berkshires won, three years the Gloucester Old Spots won, two years the Large Blacks won, three years the Large Whites won, and once the Welsh won. That showed the difficulty of deciding which were to be the four super-breeds for the trade to-day.

With regard to the improvement of the pigs in this country, on seeing the resolution on the paper he had taken the trouble to go to the cattle market at Cambridge, along with a good judge of pigs. There were 1,500 to 2,000 pigs in the market. They had come to the conclusion that 75 per cent. of those pigs could not have been bred on better lines to compete either in bacon or in pork. Another feature of the market was that there were four or five or perhaps six old boars for sale which were no use, he supposed, for further breeding. He thought that all those boars would have been quite eligible for entry in a county show and would draw very largely on the prize-money. He was quite sure, therefore, that no class of stock in this country had shown such marked improvement during the last ten years as the pig.

The point at issue and the whole trouble was the stability of price. The old saying that pigs were either muck or money was very true. For three years pigs had stood at £1 a score and then had suddenly fallen to 10s., with the result that people got fed up and sold all their breeding sows. If there was some stability in price and some regulation of imports and the trade told the producer exactly what pig was required, he was confident that the breeders of pigs in the country to-day were equal to supplying the requirements. Again, many of the breeds which might be eliminated under the resolution would be most valuable for first crossing, which, after all, was the most profitable pig for the farmer to feed. The pig which would put on most weight in a given time for the food it ate had also to be considered, and that invariably was a cross-bred pig. He sincerely hoped, in the interests of the Royal Agricultural Society, that Sir Douglas Newton would not press his motion. He had been glad, however, that Sir Douglas had suggested that the time was ripe for the Royal to give prizes for commercial pigs. There he heartily supported Sir Douglas. If Sir Douglas withdrew his resolution and gave notice to the Stock Prizes Committee to reconsider the matter at their next meeting, he believed he would receive very large support in the Council.

Lord DARESBURY thought that pigs to-day were a great deal better than they were ten years ago. He always thought of the Society first, and he was sure the Society would get into tremendous trouble if it cut out all breeds except four. Everybody would be up in arms against that. He was very glad he would not be Honorary Director when that time came, because the Honorary Director would have a very hot time of it. He sincerely hoped that the resolution would not be carried, because it was not in the interests of the Society.

Mr. JOHN EVENS, speaking as Chairman of the Stock Prizes Committee, said that the Committee considered the resolution very fully at its meeting yesterday, and he was instructed to say that the Committee was not prepared to recommend such a drastic step as that proposed. He would like to say quite seriously that the Committee were very much alive to the importance of the commercial bacon pigs. The question was discussed by the Committee yesterday, and he believed the Committee was very anxious to show to the public a class of pig to meet the requirements of the present day. It was thought that the matter should be fully discussed when the schedule was prepared for the 1933 show. He strongly supported what Mr. Webb had said, that the class of pigs had improved marvellously in the last few years and was being very largely brought up to present-day requirements.

Mr. C. W. H. GLOSSOP said that he approved most heartily of the principles which prompted Sir Douglas to bring his resolution forward. He thought that Mr. Webb's argument that the Society might lose membership by curtailing the number of breeds carried no weight at all, for, unless agriculture could be put on a stronger footing in this country, the Society would soon go out of existence, because there would be nobody to be a member of it or able to afford to exhibit at the Show. He thought it was up to the premier Agricultural Society in the world to give a lead and try to assist the farmer in the country to produce the right kind of article, whether cattle, pigs or anything else. Reports had been made to the Council to-day of all sorts of investigations that were going on. There had been reports about the raspberry beetle as well as the little worm which attached itself to the soil on potatoes. He thought the Council might seriously consider the setting up of a Committee to investigate thoroughly the pig population of the country so that perhaps in the course of a year, or even two or three years, the Society might be able to issue with confidence to the whole country its views as to what were the most suitable breeds of pigs, so that pigs might be produced which could compete on reasonable terms with competitors abroad. He was not a pig producer. He knew nothing about pigs, but there must be thousands of farmers in the country who, like himself, knew nothing about pigs but wanted to produce a pig suitable for the bacon factories. Those farmers wanted a lead from some such body as the Royal Agricultural Society and a recommendation after investigation as to what was the most suitable type to defeat the competition of the foreigner.

Mr. ADEANE thought that the Council was very grateful to Sir Douglas Newton for bringing this question forward. (Hear, hear.) He was sure they had great sympathy with much that the mover had said, but they found it very difficult to support the resolution, because, as Lord Daresbury, who knew better than anybody, had said, when they began to select four breeds as the only pigs worthy of breeding they would be in hot water at once. He had read a great deal about pigs and had kept a good many pigs in his time, but he could not make out what was the position of the Government or the Ministry and what the Ministry was recommending. Something definite was required. As far as he could understand, the Government would stabilise the pigs by some system, but the farmer must undertake to produce pigs best suited for bacon purposes. At the last meeting, or the meeting before, the Council was told that if the Society could not go into politics it could do nothing. He disagreed with that absolutely, but he thought on this occasion they could say they could do something, and, although he did not agree with the resolution, he hoped the question would be referred to the Stock Prizes Committee, that that Committee would go into the question, and, if necessary, interview the Minister with regard to what his proposals really were and what sort of pig was required to be produced. If the Society could get that out of the Minister it would have done good work for the agricultural interest.

Sir WALTER GILBRY thought the resolution was altogether too drastic and hoped that Sir Douglas Newton would see his way to withdraw it. He thought Sir Douglas, in bringing the question forward, had done more useful work than had been done for some time on behalf of the pig industry at the Royal Council. If the matter was left in the hands of the Stock Prizes Committee or a committee

appointed for the purpose, he felt sure it would end in something extraordinarily beneficial to the pig industry of the country. A big pork factory, close to his home, had run for some years, but was not successful. Plenty of capital had been invested in it, but that capital was lost because the factory did not know, in the first place, what standard of pigs to produce, and then when they did produce them they could not sell them. He did not think it would be in the interests of the Society to pass a resolution of so drastic a character.

Sir DOUGLAS NEWTON was glad that the resolution had led to such an interesting discussion. With regard to the loss of membership which might result from the cutting out of certain classes of pigs, the resolution did not in any way prevent any breed society from offering whatever prize it might care to offer. Therefore it did not really cut out any prizes except those given by the Royal Society. When one was asked what the trade wanted, the answer was very clear. The trade wanted the £41,000,000 worth of imported bacon which came in last year. That was what the trade wanted, and it was the business of agriculturists to produce an article as closely allied and as similar in every respect to that bacon as they possibly could.

However, in view of the trend of the discussion, he would ask leave to withdraw his resolution on the understanding that the matter was very carefully considered by a committee of the Society and that there should be an opportunity for investigating the possibility of establishing commercial classes for baconer and porker pig meat. If he might be allowed to withdraw the resolution in that way with that request attached, he and his seconder would be glad to withdraw it.

Mr. BORLASE MATTHEWS agreed to the withdrawal of the resolution on those conditions.

The PRESIDENT said that, after the very interesting discussion, he took it that the Council would agree to allowing Sir Douglas Newton to withdraw his motion on the considerations he had put before them.

Mr. ADEANE moved that the question be referred to the Stock Prizes Committee.

Mr. ROLAND BURKE seconded.

The motion was agreed to.

Mr. JOHN EVENS assured the Council, on behalf of the Stock Prizes Committee that the matter would receive very careful and sympathetic consideration.

WEDNESDAY, MAY 4, 1932.

LORD MILDMAI OF FLETH (President) in the Chair.

Mr. Anthony R. Hurd, Mr. J. G. McDougall, and Mr. Stephen Thompson were elected Governors, and 31 new members were admitted into the Society.

Sir MERRIK BURRELL presented the Report of the VETERINARY Committee. He felt sure that the Council would like to associate itself with the sympathy expressed by the Committee to Mr. Quested on the misfortune which had befallen him in connection with his pedigree stock.

As the Council had heard, he had attended the Conference called by the Royal Institute of Public Health on Bovine Tuberculosis. There was a very long discussion, but he did not know that anything very much more was achieved than to bring to the surface the tremendous difficulties of a very complex question. It was eventually decided that, in view of the fact that the Minister of Agriculture gave an undertaking to the House of Commons in February that the Government would look into the diseases affecting dairy herds, nothing should be done until the Government had time to implement that undertaking. It came to light also that the difficulty of the public in getting the high quality of milk which it was most desirable they should obtain did not lie entirely at the door of the farmer. The great difficulty was that the public were not sufficiently educated as to the value of good milk as a high-class food. The fault for that lay, to a very large extent, at the door of the medical profession. A gentleman, whose name he would not

mention, but who had done almost as great a work for milk as the late Dr. Stenhouse Williams, told the Conference that he had gone on his knees to many London hospitals and begged them to buy a better class of milk. He also said that, so far as he knew, only one of the great London hospitals to-day was buying milk of a quality that any ordinary man could possibly advocate. In the provincial hospitals the supply of milk was much better, but the one idea of the London hospitals seemed to be to buy the cheapest milk they could get. Very often it was surplus milk that had been hawked up and down the metropolis for sale and had been pasteurised probably two, three or even four times, and had lost thereby practically the whole of its food value. That would show the difficulty of dealing with the question. It was left for the Royal Institute of Public Health to form a small committee to watch events and do what work they could in educating the public mind on the subject.

With regard to swine erysipelas, it was not generally known, and he thought it as well to mention it, that a quite effective vaccine was available on the market to-day. Professor Buxton, whom he happened to see yesterday afternoon, told him that they had tried, and made the vaccine at Cambridge, and that it was available to veterinary surgeons who wished to use it in their clients' herds.

The Report of the STOCK PRIZES Committee having been presented, Sir DOUGLAS NEWTON said that he desired respectfully to thank the Committee for the great attention they had paid to the question he raised at the last meeting of the Council. He was particularly glad the Committee had seen their way to make what was a very considerable departure in the practice of the Society and to take active steps to encourage commercial pigs. He was also glad that the Committee had been able to do so, because it must be recognised that agriculturists had passed away from the old processes in agriculture and were now definitely embarking upon new lines of development. He was also ever mindful of the appeal of the Prime Minister that the country should so mould its policy as not to import a shilling's worth of goods which could be equally well produced at home. There was no doubt that the commercial pig had made far too big inroads into this country, and the lead which the Council was now giving would, he was sure, be welcomed by agriculturists and be very valuable to them.

Mr. ADEANE wished to mention one question. It was rather late to delay the consideration of those detailed matters until October. He thought it was very desirable that questions of prizes and judges and killing should all be decided earlier than that, and also that the whole matter should be announced at the Annual Meeting held at the Royal Show. The sooner it was known the better.

Mr. EVENS suggested that the Stock Prizes Committee should consider the question again at its next meeting at the end of the month, and make a further report to the Council at the meeting on June 1st, the day after the Committee met.

The PRESIDENT thought Mr. Evens's suggestion had the full concurrence of everybody. It was rather desirable that the matter should be got on with.

In presenting the IMPLEMENT Committee's Report, Colonel STANFORTH said that although a very detailed account of the meeting of the Committee yesterday with the Agricultural and Road Machinery Manufacturers' Association appeared in the report, the Council might want him to say a few words about it, because the Implement Section of the annual exhibition was a very important one in every way for the Society, especially financially. It was very needful, therefore, to keep in touch and in close friendship with the implement makers. They had always done so in the past and would always try to do so in the future. But at this time, when there was depression in everything, the implement makers had suffered very severely, and naturally considered how they could diminish their expenditure at the Royal Show. It would, perhaps, interest the Council to know that the representative of one firm said that their expenses at the Royal Show amounted, roughly speaking, to £1,000. Out of that amount they had to pay to the Royal Agricultural Society about £75. He (the speaker) suggested to the deputation that they might look at the £925 at the same time as they were looking at the £75. He thought the latter figure rather made the deputation see that the Royal were not really the people who could diminish their expenditure to a very great extent. The

matter had been carefully gone into at the time the stock entry fees were reduced, because it was known there would be feeling on the part of the implement people if the fees were reduced on one side and not on the other. Having regard to the expenditure the Council were put to in the erection of shedding, the finding of the ground, the supply of water, gas and electricity, it was found that the fees could not be reduced. The amount per foot charged to the implement people was not excessive, and the Committee felt that a reduction could not be made. If it was possible to reduce the costs, as suggested by the implement people, by putting up the sheds and so on in the same way as the Three Counties Show, that might be done. The Committee had suggested that the Secretary, the Surveyor, and the Honorary Director if possible, should go down to visit that show. The Committee were most anxious to meet the implement makers in every possible way, and he hoped the meeting yesterday had proved that. He (the speaker) was afraid he had not been able to promise the implement makers much, except that the Society would do everything in its power to reduce the expenditure and was only too anxious, either now or in the future, to give careful consideration to any suggestions that they wished to put forward. He hoped, therefore, that some good would come out of yesterday's meeting.

BUTTER MARKING ORDER.—The SECRETARY read a letter from the Butter Marking Order Committee of the Royal Empire Society stating that a Marking Order under the Merchandise Marks Act, 1926, had now been made by the Privy Council in respect of butter. The Order is dated March 17th, and will operate as from June 17th next.

WEDNESDAY, JUNE 1, 1932.

LORD MILDMAY OF FLETE (President) in the Chair.

Sir Fitzroy H. Anstruther-Gough-Calthorpe, Bart., Elvetham Hall, Hartley Wintney, Basingstoke, and Mr. T. G. Arnold (representing the Co-operative Wholesale Society, Limited) were elected Governors, and 133 new members were admitted into the Society.

In presenting the Report of the VETERINARY Committee, Colonel STANYFORTH referred to the following letter which the Veterinary Committee suggested should be written to the Minister of Agriculture:—

The Highland and Agricultural Society of Scotland has brought to the notice of the Council of the Royal Agricultural Society of England the fact that the Government of Northern Ireland consider that a sufficiently strong case has been made out against imported foreign vegetables as the cause of the last outbreak of foot-and-mouth disease in Northern Ireland to warrant their exclusion.

My Council understands that H.M. Government of Great Britain has not deemed it wise to take a similar step, owing to its considering that an absolutely conclusive case has not been made out in this instance.

My Council realises that action taken by you, similar to that taken by the Minister of Agriculture for Northern Ireland, would have so much more important and far-reaching effects, both politically and economically, that you are fully justified in acting with a greater degree of caution than he need adopt.

But my Council is deeply impressed by the information it has received through the Highland and Agricultural Society, and cannot believe that the Minister of Agriculture for Northern Ireland took the important action he did unless he had sufficient proof to convince any reasonable man that imported foreign vegetables were the cause of the outbreak.

My Council does not consider that in a case of this sort it is either necessary or wise to wait for evidence of the kind necessary to convince either the legal or the scientific mind; more especially so as these vegetables have been long suspect as a most probable carrying agent for foot-and-mouth disease.

I have been, therefore, requested to express to you the Council's anxiety over the situation, and respectfully ask if you will be so kind as to receive a small deputation from this Society to discuss the matter.

If you could see your way to extend to the Highland Society and the Royal Ulster Agricultural Society the invitation to send representatives to meet you at the same time, it would afford my Council much satisfaction to work in conjunction with them.

He need not dwell upon it except to say that the Committee felt, after what Sir Merrick Burrell had said at the meeting yesterday, that it would be much more advisable to have an interview with the Minister of Agriculture than simply to write a letter.

Lord STRACHIE hoped the Council would take other action if satisfaction was not given by the Government. There might be difficulty, because Lord Snowden objected to anything of the sort. There were difficulties in the old days when he (the speaker) had the honour of representing the Board of Agriculture in the House of Commons. At that time he was most anxious to stop the importation of animals and vegetables of every kind from countries where there was foot-and-mouth disease, but he had always been met with the objection, "You are a member of a Free Trade Government, and we must have free imports and take the risk." A Protectionist Government had now been returned by the country, so that that argument could not now be used, and there should be protection in the future for our flocks and herds.

He hoped the Council would do everything it could to urge the Government to take strong action in the matter, which he regarded as most serious.

Sir Merrick Burrell, as Chairman of the Veterinary Committee, was appointed a member of the proposed Deputation, and the selection of a second representative was left in the hands of the President.

Mr. JOHN EVANS, in presenting the Report of the STOCK PRIZES Committee, said the entries for the Southampton Show for all classes of stock were only just slightly below those of last year. He hoped that the Council would regard that as satisfactory seeing the difficulties of the present day and that the Show was to be held rather at one end of the country. It would be remembered that at their meeting a month ago the Council agreed to four new classes for bacon and porker pigs. The Committee suggested that those classes should be judged by a member of the bacon trade in order to show farmers and members the class of pig that bacon curers actually required.

He might say that the classes were looked upon as purely educational. They were put forward at the present time in the hope that they might assist in the production of more bacon in England, and, consequently, keep at home a little more of our money. The Committee considered that the classes were more to the advantage of members generally than perhaps to the individual who showed pigs. Further, they suggested that the entry fee should be lowered to £1 per pen for members or non-members. That being so, he ventured to hope that the classes would be filled. Some people said that they would not, but if they were not filled they would be automatically cancelled under the existing Regulations. He thought the Council would have satisfaction in feeling that all that could be done to foster the industry had been done.

If he might, he would, in two sentences, give his own private opinion. He thought that pig production turned very much, in fact almost entirely, on the question of price. He firmly believed that if farmers could reasonably assume that the price would be a paying price, pigs would be produced in the quantity and of the quality and size required. He might further say, with all respect, that in his humble opinion "the powers that be" had rather begun at the wrong end by asking farmers to produce pigs without knowing what demand there would be for them when they were produced. He considered that agriculturists had been educated too long in that school.

The Report of the SELECTION AND GENERAL PURPOSES Committee having been presented, the PRESIDENT explained to the Council the circumstances which

necessitated the course taken in connection with the extraordinary meeting of the Committee. It would be remembered that the last Council meeting was held on May 4th. Two days afterwards it was intimated in the newspapers that Sir Douglas Newton had been selected as Agricultural Adviser of the British delegation to Ottawa. It was also intimated that the Ministry proposed to ask the Royal Agricultural Society to nominate a representative to the Committee to be appointed in the circumstances described in the report. On the following day, Saturday, May 7th, there came to Bedford Square a formal request from the Ministry to appoint a representative and to appoint him at once. Under those circumstances there was no time to be lost. It was within a week of Whitsuntide, and it was essential that the nomination should go in at once, it being impossible to put it off until after Whitsuntide. The correct procedure would have been to call a meeting of the Selection and General Purposes Committee for Wednesday, May 11th, and, that Committee having chosen a representative, to call a special meeting of the Council for the same day, when the Council could be asked to endorse the choice. On second thoughts, however, it appeared that at a Council meeting called at such very short notice, only two days, quite unexpectedly and very close to Whitsuntide, there would be very great risk of not securing a quorum of twenty members. In that event the Council would have been powerless, and members would have been brought up to London for nothing. It was almost a certainty that that would be so. Therefore, he got into touch at once with one or two prominent members of the Council, and they all agreed that the only possible procedure was to summon an extraordinary meeting of the Selection and General Purposes Committee for May 11th and to rely on the readiness of the Council at its next meeting to endorse the choice. He hoped and believed that members would agree that that was the best, the right and, in fact, the only course to take. (Hear, hear.) The Committee came unanimously to the conclusion that Sir Arthur Hazlerigg was the best man to represent the interests of the Society. There was no need to press Sir Arthur's outstanding qualifications for the position, because they were undeniable. Having regard to Sir Arthur Hazlerigg's knowledge of agricultural conditions, his personality and capability, there could be no better man.

They had been asked to nominate a second representative as a substitute, as it was put. Mr. John Evens, who occupied the position of Chairman of the Stock Prizes Committee, had, over and over again, proved his competence to represent the Society, and he was glad to say that he had consented. (Hear, hear.)

Sir Arthur Hazlerigg was not present at the special meeting of the Committee, as he had much business to attend to as Chairman of his own County Council. The unanimous wish of the Committee was at once communicated to him, but he was most reluctant to accept, it being obviously most inconvenient to him. Sir Arthur had a great number of private and public engagements, because he was a very busy man in Leicestershire, and felt that it would be very difficult for him to attend. He (the President) put pressure upon him and appealed to him, and he was glad to say that Sir Arthur was not deaf to that appeal. In the end, he gave up all else to serve agriculture and serve the Society in the way desired. He was sure that they would all agree that there was reason to be most grateful to Sir Arthur Hazlerigg for doing as was wished and that they would all want to tender to him warm thanks. (Applause.)

To show how pressing the matter was, the Advisory Committee had already had two meetings. The question of appointing a nominee could not wait.

Mr. BURKITT, moving the adoption of the Report of the DAIRY AND PRODUCE Committee, said that members would be glad to hear that the entries for the milk yield and butter test classes at the forthcoming show were up to the average of recent years. He had not yet got the final figures with regard to the butter-making competition, but the entries were quite sufficient to make a satisfactory attraction at Southampton.

On the subject of Dr. Voelcker's recommendation, whilst everybody would like to see the position with regard to the milk standard, so far as prosecutions were concerned, clarified, the matter was one that could not be dealt with hastily.

He thought that that fact had rather influenced the Committee in deciding, whilst sympathising with Dr. Voelcker, not to go further in the matter. When a case came before a bench of magistrates there was always one unfortunate thing: the regulations laid it down that when an analyst gave his report to the magistrates on a sample of milk he had to state that it had, say, 2½ per cent. of butterfat, which was equal to 20 per cent. of added water. There was nothing more likely to give a farmer an unfavourable start off than immediately accusing him of adding water to milk. It meant that the farmer got no sympathy—which probably, at times, he did not deserve. There could easily be an improvement effected. While the Committee were ready to help in every possible manner to secure an improvement in regard to prosecutions, they did not feel that they could go further in the short time at their disposal yesterday, the occasion being the first on which the question had been brought forward.

Sir ARTHUR HAZLERIGG said that on his appointment to the Advisory Committee he had at once got into touch with Mr. Turner, who had been good enough to give him a long and most interesting report of the whole history of the Quarantine Station. This had been put in, and he hoped and believed that it might be of very great use at Ottawa.

For the ensuing year the Trustees of the QUEEN VICTORIA GIFTS Fund recommend a grant of £180, to be devoted to 6 gifts of £10 each to male candidates; 3 gifts of £20 each to married couples; 6 gifts of £10 each to female candidates. The distribution in each class to be left until after the election to pensions by the Royal Agricultural Benevolent Institution.

WEDNESDAY, JULY 6, 1932.

LORD MILDMAY OF FLETE (President) in the Chair.

Before proceeding with the formal business, The PRESIDENT said he was sure that it would be the wish of the Council that a resolution of sympathy should be sent to the relatives of the late Mr. Leonard Sutton, whose family had for so long had a close association with the Society and the Royal Show. Mr. Leonard Sutton was elected a Member as long ago as 1882 and became a Governor of the Society in December, 1924.

Many of those present would remember what a tremendous amount of work he did for the Society when the Royal Show was held at Reading in 1926. He was Mayor of Reading in that year and took a very keen and personal interest in everything appertaining to the success of their visit to Reading. He worked assiduously throughout all the preparations, and eventually obtained a promise from their Majesties the King and Queen to visit the Reading Show. Mr. Leonard Sutton would be missed in many spheres of Agricultural, Horticultural and Educational life.

He would ask the Council to show their appreciation of Mr. Sutton's work for the Society and their sympathy with his son and the bereaved relatives by standing for a moment.

Members rose in their places.

Mr. ADEANE said he had no report to present, but he would like to deal with one question—not a very big one—and that was the question of conversion of War Loan. The Society held £15,294 nominal in the 5 per cent. War Loan, and he took it that the Council would wish to convert that into the new 3½ per cent. War Loan. He would, therefore, move "That the nominal amount of £15,294 in 5 per cent. War Loan held by the Society be transferred into the new 3½ per cent. War Loan, and that the President and Chairman of the Finance Committee be authorised to complete the transaction."

Mr. ROLAND BURKE seconded the motion, which was put to the meeting, and carried unanimously.

Upon a Motion from the Chair, the Common Seal of the Society was ordered to be affixed to the document carrying out the conversion.

On the motion of Mr. ADREANE, seconded by Mr. WILLIAM BURKITT, it was resolved :

That the best thanks of the Society are due and are hereby tendered to :—

- (1) The OFFICIALS OF THE GENERAL POST OFFICE for the efficient postal arrangements in connection with the Show.
- (2) The CHIEF CONSTABLE OF HAMPSHIRE for the efficient Police arrangements in connection with the Show.
- (3) The ST. JOHN AMBULANCE BRIGADE No. 2 District (Hampshire Corps) for the efficient Ambulance arrangements at the Show.
- (4) MESSRS. BARCLAY'S BANK, LIMITED, Local Bankers, for the efficient services rendered by their officials.
- (5) MESSRS. MERRYWEATHER & SONS, LTD., for the provision of fire protection appliances and for the efficient arrangements made by them in connection with the Fire Station in the Showyard.
- (6) MESSRS. SHEPHERD & HEDGER, 13-17 High Street, Southampton, for decorating and furnishing the Royal Pavilion.
- (7) MESSRS. TOOGOOD & SONS, LTD., Southampton, for providing floral decorations at the Royal Pavilion.
- (8) The YOUNG MEN'S CHRISTIAN ASSOCIATION (Bournemouth Division) for providing reading matter, writing materials and refreshments, and for organising welfare work for stockmen and grooms in the Showyard.
- (9) The ELECTRICITY COMMITTEE OF SOUTHAMPTON CORPORATION for free electricity for Herdsmen's Refreshment Tents in Showyard.
- (10) The WATERWORKS COMMITTEE OF SOUTHAMPTON CORPORATION for free supply of water to the Showyard.
- (11) BURROUGHS ADDING MACHINE CO., LTD., for the loan of a calculating machine for use at the Dairy in connection with the Milk Yield and Butter Test Competitions.

Letters of thanks were also ordered to be sent to various other individuals and firms for assistance kindly rendered and for the loan of articles for the purposes of the Show.

Proceedings at the General Meeting of Governors and Members

HELD IN THE LARGE TENT IN THE SHOWYARD AT SOUTHAMPTON,

WEDNESDAY, JULY 6, 1932.

LORD MILDMAI OF FLETE (PRESIDENT) IN THE CHAIR.

The PRESIDENT said they met there that day on one of the few occasions when the Royal Show had been held in the South of England and upon the second occasion only that it had been held at Southampton. There were very many and good reasons why the Society had not been able to visit Southern centres, and these he need not enlarge upon, but perhaps the chief reason was the difficulty of obtaining a site large enough and level enough to accommodate the Show. This difficulty was actually experienced at Southampton. The Royal Show could not be staged, if he might so put it, on the "Common" without detracting from its amenities for many months of the year. This could not be thought of, but, by the goodwill of Mr. Willis Fleming, and his agent, Mr. Alan Arnold, the present site at Stoneham Park was offered to the Society, and most gladly did they accept the offer.

It was perhaps a little too far out of Southampton Town to please some exhibitors, but there were few places in the country now where vacant spaces

large enough to take the Show could be found, either in the centre of, or in close proximity to, a town. He was sure, however, that it was an admirable site, well laid out, and well adapted for a showground.

Having secured a site, the next care was finance, and they were greatly indebted to the Lord Lieutenant of the County, General J. E. B. Seely, for being so good as to call a meeting of all those interested to launch the appeal for funds.

They were also grateful to the Mayor of Southampton in 1931, Councillor E. W. Cross, for so kindly undertaking the preliminary organisation, and particularly were they grateful to his successor, the present Mayor, Councillor F. Woolley—(applause)—who could truly be said to have borne the burden and heat of the day, for, not only had he in his office as Mayor done all he possibly could to further the success of the Show, but he had undertaken the duties of local honorary secretary, and carried these out with conspicuous ability. No one who had not actually undertaken the responsibilities of such a position could realise what an immense amount of detail and correspondence had to be handled.

Members of the Society and exhibitors would not need to be told how much they owed to the untiring efforts of Mr. Burke (their Honorary Director) and their very efficient Secretary, Mr. Turner. They were all most grateful to them for their unremitting work.

Those present would all realise, he was sure, that, even after all the preliminary arrangements had been satisfactorily concluded, much remained to be done. The close co-operation of exhibitors was necessary, and he would tender to them, on behalf of the Society, their warmest thanks for the efforts they had made to support the Show. To those who were showing all the best of their live stock and to the exhibitors of agricultural implements and machinery they were thankful, for it required a very great deal of courage and a spirit of true optimism to undertake in these difficult and depressing times the expense and labour of preparing and sending exhibits in any section of this their National Show. Might he personally express the hope that such courage had been rewarded by the business they had secured at the Show.

At the Council meeting early that morning, resolutions of thanks were cordially approved and would be sent to many individuals and firms who had directly helped towards the success of the Show, and the general meeting would shortly have put before it for endorsement votes of thanks to the local Committee, the Railway Companies, and others. There were, however, many individuals to whom their gratitude was due, but who could not be specifically thanked by resolution, and these he would ask to accept his own thanks and the thanks of the Council for help so willingly given.

It had been often said that figures could be made to prove anything, so he did not intend to give many on that occasion. He knew that the success of some agricultural shows was estimated according to the number of entries obtained. He would rather ask them to judge this show in the same way that the judges of stock formed their opinions yesterday, not on numbers, but on the quality of the exhibits brought together there.

In passing, however, it might be interesting to observe that in 1844, the last occasion on which the Royal Show was held at Southampton, the classification in the schedule contained only 4 distinct breeds of cattle, 2 of horses, 3 of sheep, and 2 of pigs; whilst to-day there were on exhibition for all to see 9 distinct types of horses, 17 distinct breeds of cattle, 16 breeds of sheep, and 8 breeds of pigs, with a total of 2,597 animals claiming attention from the judges.

They had got a very representative entry, and as large a one as could reasonably be expected in these times. It was true that several breeds usually seen at the Royal did not appear on account of lack of support, and, in the cases of those who were disappointed, he would urge the Society responsible for the breed to impress upon their members the need to make their entries in good time and to endeavour by "personal touch" to obtain an assurance from breeders that the required support would be forthcoming, for it was surely a very bad advertisement for any breed to have sparsely filled classes at any big show. That brought him to another point in connection with which the Society had brought upon itself

some criticism. Many of them would have heard that at Derby next year classes were to be included for pork and bacon pigs—two classes for pedigree pigs and two classes for pigs of a first cross between any pure breeds. This might seem a departure from the usual "Pedigree" standard which had hitherto dominated the Royal Show; but much thought and discussion had been given to the question, and special conditions would apply to the classes to popularise them. For instance, the classes were to be judged by a trade judge or bacon factory expert on inspection in the showyard. The prizes would be on the same scale as for pedigree animals, but the entry fee would be only £1 for all exhibitors, whether members or non-members. It was hoped that this innovation would give a real stimulus to pig production.

It would help to standardise the pig, and would enable the farmer to produce the type of animal required by the trader and bacon factory for their particular purpose. It was for such further standardisation of pig-production, in close accordance with the requirements of the market, that the Minister of Agriculture had asked. They were told that they must do their part, and then they might perhaps hope to secure from the Government that stabilisation of prices about which so much has been said and written.

As agriculturists their eyes were now naturally turning to the Imperial Economic Conference at Ottawa, and members, he knew, would join with him in wishing well to the Minister of Agriculture, Sir John Gilmour, and their Member of Council, Sir Douglas Newton, who had been appointed one of his advisors on the many intricate problems and questions which would be tabled for discussion at that Conference.

Those of them who followed the proceedings of the Society's Council would know that the Ministry had requested the Society to appoint a representative upon an Advisory Committee which was to assist Sir Douglas Newton to gain a first-hand knowledge of the farming problems existing at home, and Sir Arthur Hazlerigg very kindly consented to act as their representative. (Applause.) He believed that they thought as he thought, that no better delegate could have been chosen, for Sir Arthur was a man of very determined views on agricultural matters. They all fervently hoped that success might attend the efforts of the Minister and his colleagues, and that as a result of their deliberations at Ottawa some promise of better times for stock breeders and their great industry of agriculture might be forthcoming.

It might interest members to know that the Council of the Society had that morning decided to take the patriotic action of accepting the conversion of their holdings of £15,294 5 per cent. War Loan into 3½ per cent. War Loan in response to the urgent appeal made to them by the Chancellor of the Exchequer.

So far this Show had not been affected by the dreaded scourge of foot-and-mouth disease, which last year caused the cancellation of all live stock entries at the Centenary Show of the Highland and Agricultural Society of Scotland, and the segregation of a number of cattle, sheep and pigs from what became an infected area, in a special camp outside their Warwick Show. This was one of the contingencies to be faced by show promoters, and added greatly to the anxiety of the officials. He hoped that nothing of the kind would happen this year and that the Show would run smoothly and successfully to its conclusion.

They were shortly to receive a visit from Their Royal Highnesses the Duke and Duchess of York, and he was sure it would be the wish of them all that he should extend to them on the Society's behalf a very hearty welcome to the Show.

His Majesty the King and all the members of the Royal Family took a keen interest in agriculture and live stock breeding, as well as a personal interest in their great Society and its traditions. He trusted that Their Royal Highnesses would be able to make a good report to His Majesty as to the success of their efforts at this year's Show. (Applause.) The Society was most grateful to them for their visit.

No one man could ensure the success of any show. It was dependent upon so many circumstances—the weather, the suitability or popularity of the venue of the show, the freedom of the country from animal disease, agricultural and

industrial economic conditions—these were all factors to be reckoned with, and consequently it was not in a lighthearted way that any show-promoting body could in these days organise a show, whether large or small, without some fear or anxiety as to the result; but he would like to feel that, as a consequence of the Southampton Show, the Council of the Royal Agricultural Society of England would be encouraged to come more frequently to the South of England with that great educational venture, and particularly did he hope that they would not allow another 88 years to elapse before again visiting Southampton. (Applause.)

Thanks to Local Committee.

Mr. ROLAND BURKE (Honorary Director) moved: "That the best thanks of the Society are due, and are hereby tendered, to the Southampton Local Committee for their exertions to promote the success of the Show." It would, he said, be obvious to everyone that the success of the show must depend upon the local support the Society received, and they had been indeed fortunate in that locality in having the advantage of a most efficient and able Committee who had done everything in their power to promote the success of that show. The local organisation in this case had been somewhat unique. There was not only a Committee in Southampton, but there were also influential Sub-Committees in the four counties of Hampshire, Dorset, Wiltshire, and Sussex. He was sure those present would forgive him if he did not in the brief time at his disposal mention everyone who played such a large part in the work of those Committees; but the Society was indeed grateful to the Lord Lieutenant, the Chairman of the Committees and the Local Secretaries in those counties for all they had done in these difficult times to carry out the local organisation in connection with that year's show. He would like particularly to associate himself with all Lord Mildmay said with regard to the part taken by Mr. Woolley. (Applause.) Mr. Woolley and his daughter between them had done an enormous amount of work from the very beginning. He would also like to associate himself with what had been said about Mr. Willis Fleming and Mr. Alan Arnold, his agent, and he would particularly mention Mr. Brown, the tenant of the land, who had been of enormous help to them, and had never spared himself in the preparations for the show. In conclusion, he would like personally to thank all those who had had a close connection with the show for their kind help to him in the effort to make the show a success.

Lt.-Col. E. W. STANYFORTH did not think many words from him were necessary, after what they had heard from the Honorary Director, to second that resolution. But he supposed that unless one had served as a member of a local committee himself or was associated with the Council and thus knew what the difficulties and troubles with regard to the arrangements of a show meant, one did not realise the extent of the work necessary from the local committee. The success or failure of a show depended to a great extent on the efforts of the local committee. In that instance, and in that year, it had been much more difficult for the local committee, especially with regard to finance. They had, however, helped the Society in the best way they possibly could, and the thanks of the members were due to them.

The resolution of thanks was carried unanimously.

Councillor E. W. CROSS, in acknowledging the vote of thanks, said he was deeply sorry that the Mayor of Southampton was not present. As they knew, he was welcoming the Duke and Duchess of York. Southampton was very pleased to receive the Royal Agricultural Society. It was 88 years since the Society's last visit, and he could only express the hope that they would not wait another 88 years before coming again. If any of those present could spare any time from the show he hoped they would take the opportunity of looking round the town. There were many places of interest and some of antiquity. They had the finest docks, which were the gateway of the world. Great developments were in progress which he ventured to suggest were worthy of attention.

As a Local Committee they had had rather a difficult time. Of course, one of their duties was to raise funds, but he did not think that any local committee

had ever before been faced with such difficulties as they had had. In the first place, it was beyond the power of the Town Council to give a grant and the usual guarantee. When the Local Committee started their labours there came the upheaval of last autumn and the turmoil of the General Election. Then the people had to part with a fourth of their income—three-quarters of it payable at one time. Altogether their difficulties had been very considerable, and he could only assure the Society that the Local Committee had done their very best. He hoped that any shortcomings on their part would be made up by a good attendance at the show. When members left the town he hoped they would be well satisfied with what Southampton had done.

As a town, Southampton was progressive: it had its own water and electricity undertakings and tramway service. Although the Council were not able to make a grant, they had been able to help the Society with a supply of water, entirely free, and with electricity. They had an excellent tramway service, which was capable of bringing people quickly to the show and at very frequent intervals.

He desired to express his thanks to Mr. Burke and to Mr. Turner. They had worked hand in hand with the Local Committee, and never had there been the slightest friction. The chairmen and secretaries of the local committee in Sussex, Wilts, and Dorset had been a very great help. He also acknowledged the co-operation of the Chief Constables of Hants and Southampton, which had resulted in most efficient police arrangements.

He thought it must be unique for the Mayor of the town visited to be also acting as local secretary in connection with the show. Having himself recently occupied the position of Mayor, he well knew what the duties entailed, and he marvelled at what Mr. Woolley had done; but it would hardly have been possible for him to carry on the local secretaryship without the assistance of his daughter, who had been a tower of strength, and the Local Committee owed a debt of gratitude to her for all the help she had given them. To the Society he tendered the town's best wishes for the success of the show.

Thanks to Railways.

Mr. C. W. H. GLOSSOP, M.P., moved that the best thanks of the Society be tendered to the Railway Companies for the facilities afforded by them in connection with the show. It was, he said, a particular pleasure to him to move this resolution, because it was only a few years ago that at this identical meeting he moved an amendment to a similar resolution. He believed that it was the criticism of the railways in the past that had resulted in the close attention which the companies now gave to agricultural societies' members. The efficient way in which the Southern Railway had dealt with the traffic was the more creditable, because they were not called upon to handle the Royal Show traffic frequently. All grades of the staff were worthy of the highest praise. He believed the railwaymen regarded it as a privilege to have something to do with the show traffic, and thanks were especially due to the lower grades for the loyal way in which they helped the stockmen in bringing their exhibits to the show.

It was invidious to mention names, but he would like to propose a special vote of thanks to Mr. Richards, Divisional Superintendent of the London West Division, who was responsible for the work. As agriculturists, they hoped that with the revival of their industry they might in some small way assist the revival of prosperity for the railway companies.

The Rev. C. H. BROCKLEBANK, in seconding the motion, said the proposer of the resolution had entered into so much detail that it left him little to say. He himself belonged to the railway generation, and expressed his preference for that mode of transport. If one drove a motor car it was necessary to keep one's eye on the road; if someone else drove, then one must keep one's eye on the sign-post. (Laughter.)

Mr. R. S. WALTERS (Birmingham) moved that the resolution lie on the table. He had never heard, he said, that the railway companies subsidised the Society, and a vote of thanks suggested that agriculturists were satisfied with the companies and with railway rates. He was confident that agriculturists were not so

satisfied. He had asked the railway companies three months ago for a Sunday service to the Southampton Show and back for his animals, but he had heard nothing till three days before the show, and then they offered him a Saturday service. The result was that he sent his exhibits by road, and they came much more cheaply than they would have done by rail.

Mr. J. H. WILLIAMS (Smethwick) seconded the amendment. He considered the resolution unnecessary, as the railways were well paid for their work.

Another member supported the amendment. His experience was that railway rates did not compare favourably with those for road transport. He found that the charges for excess fodder by rail were invariably more than the value of the fodder, and that the charges for transport to the show were excessive and unreasonable. Pedigree stockbreeders were in for a lean time, and it was up to the railways to help them.

Brig.-Gen. A. H. O. LLOYD expressed the opinion that it would be ungracious to the railway staff not to pass this vote of thanks. He was quite certain that—to use an army expression—all “other ranks” had put their shoulders to the wheel and done the best they could. If the usual resolution was not passed, he thought a vote of thanks was due to the railway staffs.

Mr. WALTERS, mover of the amendment, expressed his readiness to support a vote of thanks if it were confined to the railway staffs.

The PRESIDENT said he was sorry to hear of the difficulties of Mr. Walters. He knew how hard it was for the companies to cope with the show traffic at this particular time of the year. All the staffs had to work for long hours, and the whole business called for far-reaching organisation on the part of the railways. As President he took an impartial attitude, but he did hope the resolution of thanks would be passed. Those present had heard the resolution, to which an amendment had been moved and seconded.

The amendment was put to the meeting, and eight members voted in favour of it.

The vote of thanks to the railways was then put, and carried by a large majority.

Members' Suggestions.

The PRESIDENT then inquired if any Governor or Member had any remark to make or suggestion to offer for the consideration of the Council.

Mr. J. H. WILLIAMS said that reference had been made to stock raising, and especially pig-breeding, but perhaps a word for the nimble little bee might be welcomed by members and others, for the question was one of great importance to this country. He had hoped to obtain information for that meeting with regard to the imports into this country of bee products and the wholesale prices, but he regretted it had not come to hand. However, the imports amounted to many tons annually, and he ventured to suggest that the industry might be made more profitable here.

Another thing he mentioned was the growing of the Dutch brown bean, for which the climate of Holland was very favourable. He had experimented with it himself, but he thought it would be an advantage to have the aggregate of individual effort in the way of experiment in this country. The culture of the soya bean, too, might, he suggested, be the subject of experiment on the part of members of the Society.

In his opinion, the bean fields of England which had been put down to grass might well be revived in the interests of agriculture and the members generally.

The PRESIDENT thanked Mr. Williams for his suggestions, of which due note had been taken.

President Thanked.

Lord HASTINGS said he had been permitted the honour of proposing “the toast of the evening,” that was a very hearty vote of thanks to Lord Mildmay for presiding over that meeting. Members of the Society would appreciate the feelings of members of Council when they saw how valuable was the kind of leadership Lord Mildmay gave to them and to the show. His lordship had given

members a taste of his quality as chairman of that general meeting, but as chairman of the Council he had displayed qualities of a kind which made them feel a great admiration for everything he did. He begged to move a very hearty vote of thanks to their President.

The Earl of RADNOR seconded the motion. He did not propose to embarrass Lord Mildmay by saying any more than to endorse everything that had fallen from Lord Hastings.

The resolution was then put to the meeting by Lord Hastings and carried by acclamation.

The PRESIDENT said he could only thank Lord Hastings and Lord Radnor for their kind references to himself and the meeting for the way in which they had passed the resolution. He felt it a great honour to be put in the proud position of President of the Society, and hoped that from his year of office would date the revival of the agricultural industry which was so long overdue. (Applause.)

WEDNESDAY, JULY 27, 1932.

LORD HARLEOH (Trustee) in the Chair.

The CHAIRMAN said his first duty was to read the following letter from the President:—

21st July, 1932.

MY DEAR HARLEOH,—

I believe that you are to occupy the chair at the prospective Council Meeting of the "Royal" on Wednesday, 27th July. Will you be good enough to explain to the Council that I am prevented from presiding by the duty which falls to me, as Lord-Lieutenant, of welcoming H.R.H. The Prince of Wales at a public ceremony in Devonshire on that day.

I much regret that I should be absent, for I should have liked to thank personally the many who did their utmost to ensure the success of the Southampton Show.

Will you please make known to the Council the terms of the enclosed communication from Admiral Brooke, Comptroller to H.R.H. The Duke of York? It was written in acknowledgment of a letter from me conveying the deep gratitude of the Royal Agricultural Society to Their Royal Highnesses, who, when leaving the Show Yard, themselves expressed to me their warm thanks for the enjoyment they had derived from their visit.

Yours sincerely,

MILDMAY.

The letter from Admiral Brooke was as follows:—

7th July, 1932.

DEAR LORD MILDMAY,—

Their Royal Highnesses the Duke and Duchess of York desire me to write and thank you for your letter, which I showed them this morning. They were delighted to hear that their presence helped the Royal Show during your year of office as President.

Their Royal Highnesses ask me to convey to you, and through you, to Mr. Roland Burke and all others principally concerned, their gratitude for all that was done to make their visit so enjoyable and comfortable. The organisation was evidently carefully thought out and so spared the Duchess any undue fatigue and enabled Their Royal Highnesses, in the somewhat short time at their disposal, to see a fair number of the very interesting exhibits.

The Duke and Duchess both hope that there will be a good attendance on the remaining days of the Show, and that, when it closes, you, as President, will consider it has been a success in every way.

Yours sincerely,

B. V. BROOKE,

Comptroller.

Lieut.-Col. C. H. Grey, D.S.O., Hocker Edge, Cranbrook, and Senor Pablo Emilio Bonfanti Pasini, Calle 25 de Mayo 489, Vo Piso, Buenos Aires, were elected as Governors and 82 new members were admitted into the Society.

On the motion of Mr. ADEANE, seconded by Lord DARESBURY, it was resolved:—

“That, in order to facilitate the winding up of the accounts of the Southampton Show as early as possible, authority be given for the issue during the recess of orders on the Society's bankers for the payment of accounts connected with the Show.”

Lord HASTINGS, in moving the adoption of the Report of the BOTANICAL AND ZOOLOGICAL (FORESTRY AND ORCHARDS) Committee, said that, as he was not present at the time the Committee was dealing with the Orchards and Fruit Plantations Competition, he would like Colonel Wheeler to deal with that part of the report.

Colonel WHEELER stated that the Orchards and Fruit Plantations Competition had now been taking place for a period of ten years or more, and during that time it had been the means of doing a great deal of good throughout the country. Next year the competition would be in the counties of Kent, Surrey and Sussex, where they began, and he hoped it would be found there would be a marked difference in the cultivation of the orchards there. Anyone interested in fruit growing would find the judges' report, which was now ready for publication, a very valuable document. Thanks were due to Mr. Boughton, who had been responsible for making out the route for the judges, which task he had carried out most satisfactorily, and in this had helped the judges very considerably.

Colonel STANFORTH moved the adoption of the VETERINARY Committee's report, in the absence of Sir Merrik Burrell. With regard to the correspondence with the Minister of Agriculture on the subject of a suggested embargo on foreign vegetables with a view to preventing the risk of the introduction of foot-and-mouth disease, he did not think it was necessary to say anything, but it was not desirable to close the door absolutely and accept the Minister of Agriculture's communication as final.

On a motion from the Chair, authority was given to affix the Society's seal to the agreement between the Society and the Corporation of Derby, relating to the Show of 1933.

Lord CORNWALLIS raised the question of the provision of a new panel to contain the Roll of Past-Presidents of the Society, as the present panel was now completely filled up. Various suggestions had been made for the position of the new panel: some members would like it to be alongside the old panel over the mantelpiece, while others suggested the provision of two panels, one on either side of the President's chair. No general measure of agreement was found, and he suggested that members of the Finance and Selection and General Purposes Committees should meet together so as to be able to present a scheme to the next meeting of the Council. It would have been convenient to have had the new panel put up during the recess, but in view of the lack of any general sense of agreement, that seemed impossible.

Colonel STANFORTH suggested that, as many members of the Council present were members of the two Committees in question, they should meet after the Council meeting, and should be given power to act upon any conclusion they came to. This would enable the work to be carried out during the recess. The sum of money to be spent on the work would only amount to £30 or £50, and it was a matter which could easily be settled by the members of the Committees in question if the Council gave authority.

Lord HASTINGS thought it would be possible to do away with the old panel and have an entirely new one, providing three columns for names instead of the present two columns. This would make provision for a greatly extended list of names.

Lord CORNWALLIS pointed out that experts who had been called in negatived such a suggestion.

The CHAIRMAN thereupon put the motion that the matter be considered by the Finance Committee, with power to act, and this was carried.

Sir ARCHIBALD WEIGALL pointed out that the Board of the National Institute for Research in Dairying was shortly making an appointment to fill the place left vacant by the death of Dr. Stenhouse Williams, the late Director of that Institute, who had always sat upon the Dairy and Produce Committee. He suggested that the new Director of the National Institute for Research in Dairying should be co-opted on the Dairy and Produce Committee, so that the Committee might have the benefit of his assistance and advice, as it had enjoyed the assistance of Dr. Stenhouse Williams.

This was seconded by Lord DARESBURY, and was carried.

WEDNESDAY, NOVEMBER 2, 1932.

LORD MILDMAI OF FLETE (President) in the Chair.

THE PRESIDENT remarked that the present was the first occasion on which the Council had met since the recess, and consequently the first opportunity he had of referring to the serious loss which the Society had sustained by the death of Mr. H. Dent Brocklehurst. Before the members proceeded to the ordinary business, he was sure they would agree with him that it would be fitting that he should at once refer to the long and continuous service which Mr. Brocklehurst had rendered to the Society. (Hear, hear.) Mr. Brocklehurst had become an ordinary member of the Society as long ago as 1891, when he resided in Gloucestershire. In the year 1906 he had been elected a Member of Council for that county, and had continued to serve on the Council until the year 1930. He resigned because he left the county. At the end of last year he had been elected a representative for London, and rejoined the Council. During the period of his service he had been a member of the Botanical Committee and the Chemical Committee, and of this latter Committee he had acted as Chairman, and had continued to do so until his resignation in 1930. Mr. Brocklehurst had taken a very great interest in the Annual Shows, and especially had he done most valuable work in connection with the meeting at Harrogate in 1929. He was well-known throughout the country as a breeder of thoroughbred horses. He himself had been a fine horseman, as were his brothers. But his interests had not been confined to horses alone; they embraced all classes of stock and scientific agriculture. He had been a close friend of many on the Council. To himself (the President) he had been a very valued friend for many years, and he thought the members would agree that the loss to the Council through Mr. Brocklehurst's death was indeed grievous. (Hear, hear.) The members would wish, he was sure, to convey their sympathy to the widow and family, and he would ask them to testify their sympathy by rising in their places.

Mr. William James Bailey, 27 Gloucester Street, Morice Town, Devonport, Plymouth, and Mr. H. R. Jenkins, The Porch, Westhild, Hereford, were elected as Governors, and 28 new Members were admitted into the Society.

Mr. ADRIANE, in moving the adoption of the Report of the FINANCE Committee, said the detailed accounts of the Show would be presented to the next meeting, but he was sure the Council would like to know at once the result of the Show, and he was able to give the figure: it was a loss of £7,800. He might say that the loss was less than they had expected.

There was one point in the Report to which he would like to allude, and that was with regard to the reduction of fees for machinery-in-motion shedding. The machinery makers of the country were some of the Society's best friends, and the Committee were very glad to be able to make the recommendation that the fee should be reduced from 15s. to 12s. 6d. per foot. Perhaps it would interest the Council to know what the charges had been since 1914. From 1914 to 1916 the charge had been 12s. 6d. per foot run. In 1920 it had been 15s. 6d. In 1921-23 it had been £1, and it had been reduced in 1924 to 15s., and had remained at that rate ever since. He was sure the Council would agree to the recommendation that the fee should be reduced.

Sir DOUGLAS NEWTON asked if he understood aright that the members would have a full statement at the next meeting of Council with regard to the rather alarming loss mentioned by Mr. Adeane, because he thought the members would like to examine the figures. The Society could not face up to a loss of £7,800. There must be some special causes for such a heavy loss other than the ordinary trade depression; it might possibly be choice of site, or possibly the show which was given to the public. He himself thought that the Society might examine the Show from the point of view of trying to make it more attractive to people who cared little or nothing about agriculture. Not only did they want to attract agriculturists but they wanted to attract the public, and in order to do that they had to give the public something which they wanted. He did not know how far it was possible to explore that field. Dog racing was a very attractive thing, and there were many other avenues which could be explored and which might attract the public to the Show in the evenings and thus help the Society to get more money into its till. At any rate, it was quite certain the Show would not continue unless they did get money into the till. That was an important point, and therefore he hoped the Committee would explore the position and put up some concrete suggestions when they presented their next Report.

The PRESIDENT pointed out that Mr. Adeane had mentioned that it was the intention to put before the next meeting of Council full details, and therefore it would be advisable to defer any criticism until the members had full knowledge of the matter.

Sir DOUGLAS NEWTON asked if the members might have suggestions put before them at the same time for attracting the public?

Mr. ADEANE explained that he had only given the figure of loss because he thought the Council would be anxious to know. Perhaps he ought not to have given any figure at all until after the audit had been completed and the accounts placed before the Council at the beginning of December. He did not think they could go into the question of side-shows at the present moment.

Lord CORNWALLIS, in moving the adoption of the Report of the JOURNAL AND EDUCATION Committee, said he hoped that very shortly the new "Fream" would be ready for issue—at any rate, before the end of the year. But for a few technical details it might have been ready at once.

On behalf of the Committee, and he was sure of the Council, he desired to tender their thanks to Sir Rowland Biffen and those who had collaborated with him in the production of the book. The volume would go out not only from the Society, but would also have the imprimatur of Cambridge, which would greatly add to its value. Already there had been a considerable demand for copies.

The PRESIDENT was sure the members would desire to take the present opportunity of conveying to Sir Rowland Biffen their real thanks for having helped the Society in the matter in every possible way. (Hear, hear.)

In moving the adoption of the Report of the CHEMICAL Committee, Mr. FRED SMITH said he desired to associate the Chemical Committee with the President's remarks in reference to its late Chairman, Mr. H. Dent Broocklehurst. Mr. Broocklehurst had been a member of the Committee for a great many years, and had presided with great credit as Chairman for three years.

Lord HASTINGS, in moving the adoption of the Report of the BOTANICAL AND ZOOLOGICAL (FORESTRY AND ORCHARDS) Committee, said the Council would have noticed a casual reference in Sir Rowland Biffen's report to the Committee of an article called "Ceresan." The great majority of agriculturists were familiar with Ceresan, but in case there were some who were not, he thought perhaps he ought to draw their attention to it. It was a form of dressing powder which had been thoroughly tried out by the National Institute of Agricultural Botany, by the Norfolk Agricultural Station and by other bodies similarly qualified. It was now in the possession of practically every seed merchant in the country, and was in use by them. Its particular value was that it acted as a complete destructor of smut; it was also a complete preventive of stripe diseases. In a word, it was about the most perfect dressing for corn that had been discovered. It had the further advantage that corn could be dressed with this Ceresan a very long time before sowing. One knew that

the liquid dressings required to be applied almost immediately before sowing in order to be effective. It was a very great advantage to be in possession of a dressing which could be applied to corn and then to be able to put that corn away until a suitable moment for sowing. While it was a proprietary article (and one did not desire to advertise it) the fact did remain that agriculture was now in possession of a form of corn dressing which was superior to anything which had gone before. He had thought it his duty to inform those who did not happen to be familiar with it.

Mr. BURKITT remarked that he would like to inform Lord Hastings that Ceresan was a Dutch or German product, and that there was on the market a British product called "Agrosan," which was exactly the same thing and which served the same purpose as Ceresan.

Lord HASTINGS said he was very much obliged to Mr. Burkitt for drawing attention to the fact. He had not been aware of it or he should not have recommended Ceresan when Agrosan was available.

Sir DOUGLAS NEWTON said, arising out of the report of the Synonyms Committee, he hoped that the interests of the farmer who grew his own seed, or who travelled abroad and bought seed and brought it over here, were being adequately safeguarded. It was an advantage to be able to go anywhere and buy seed and to use it. He was a little alarmed at the proposals of the Committee. He did not know how far they reached, but they seemed to him rather to force the user to get seed through trade channels, and somewhat to restrict him. He hoped the Committee would look into the matter and see whether the interests of the men who chose to buy their own seed where and when they liked were in any way prejudiced.

Lord HASTINGS stated that the Botanical Committee had been presented with this report of the Synonyms Committee yesterday, and had been seized with some of the fears which possessed Sir Douglas Newton in respect thereof. That was the reason why they had remitted to the Journal Committee that report, for the Journal Committee to examine it and to decide whether they thought it was desirable for publication to the members in its present form or not. The Journal Committee would remit the report again to the Botanical Committee at its next meeting with their comments as to publicity, and the matter would then be dealt with.

Mr. JOHN EVENS, in moving the adoption of the Stock Prizes Committee's Report, said there were two or three important alterations to which he thought he ought to refer. One was that in the past the Milk and Butter Tests had been carried out from milk yielded by the cows on the Thursday of the Show. Consequently the results of these tests could not be made known until about the closing-time of the Show. It was now suggested that the cows should be stripped on the Sunday night previous to the Show, and that the milk of the following day—the Monday—should be taken for the milk and butter tests in order that the results might be known early during the period of the Show.

The second point was with regard to Rule 10 of the Entry Regulations which, in the past, had demanded that under each section there should be four separate exhibitors and that the average number of exhibits should be four in each class. Owing to the expense of showing, and the difficulties of the times in which we live, there had been difficulty lately in filling some of the classes, and the Committee now recommended that the four should be reduced to three—that in future three separate exhibitors should be demanded and an average of three animals in each class instead of four. In order to avoid cancellation of classes, the Committee also suggested an alteration in the times of closing entries. Previously all entries had closed on the 20th May. The Committee now suggested that entries should close on the 10th May, but in any case where sufficient entries had not been received in any section to guarantee the carrying through of those classes, later entries up to the 20th May might be made through the Secretaries of the various breed societies. In other words, if it was found on the 10th May, when the first entry list closed, that some breeds would have to be cancelled, then the secretary of that particular breed could whip up additional entries in order to avoid cancellation, and those later entries might be sent in through the secretary of the breed society at a slightly increased fee.

Lord HASTINGS asked if it was worth while, for the sake of a few shillings, to

increase the fee? Such an increase might hamper the secretaries in doing the work which the Society wanted them to do.

The PRESIDENT thought the increased fee would be a stimulus to exhibitors to send their entries in in good time.

Mr. S. OWEN WEBB remarked that if an increased fee was not charged for the late entries people would not enter at all; they would throw the whole of the onus on to the breed secretaries if there was not some extra fee charged. It was found at the County shows that all the entries practically came in in the last week, and the people seemed quite prepared to pay a double entry fee for late entries rather than be left out.

Mr. MANSELL said he thoroughly agreed with the suggestion to make a small charge for late entries, otherwise no entries would be forthcoming until the 10th May had gone by, and the poor breed society secretaries—he happened to be one—would be very hard worked.

Mr. JOHN EVENS explained that the suggestion had been put forward rather as a temporary measure on account of the fact that the Committee were very anxious to avoid the cancellation of breeds, and were anxious to find some way out of the difficulty.

Sir DOUGLAS NEWTON said that as his name had been mentioned in connection with a part of the Report he might be allowed to say a few words. He did deplore any addition to the pig breeds which were encouraged in this country, and he would have ventured to oppose the recommendation had it not been for the fact that the Welsh Pig happened to be one of the breeds selected by the Pig Commission. At the same time he was very grateful to the Society for the generous way in which they had accepted the suggestion that the commercial pig should be encouraged, and he was very hopeful of good results from that decision. He would like to remind the Council that in the Report of the Pig Commission, para. 34, regarding standardisation of quality and type, it was stated that only two-fifths of the pigs killed for bacon at factories in this country were reputed to be suitable for the production of first-quality bacon. Then the Report referred to the superfluity of breeds and types as being one of the causes of that. Therefore he hoped an eye would be kept on the question of the classes of pigs which should be encouraged and that the number would be reduced and not added to.

Mr. EVENS stated that these particular classes of pigs had been strongly urged by the breed society, and they had undertaken to find part of the money. The position of the Committee had been strengthened by the performances of the Welsh pigs at the London Dairy Show a fortnight ago. (Mr. Evens then read the list of prizes gained by Welsh pigs at this Show.) Those results made the Committee think that these classes were worthy of being included in the Society's schedule.

Mr. BURKITT said he should be very sorry if the impression should go forth that the Society was going to attempt to dictate to the stock-breeders of this country what kind of pigs they should keep. The remedy lay in modifying their breeds to the right shape and type for the market, but he thought it would be rubbing the backs of the stock-breeders the wrong way entirely to dictate to them. He believed that when the Royal Show ceased to be the shop-window of all the breeds it would be the beginning of the end so far as the Society was concerned in the success of its shows. The duty of the Society was to provide breeders with the opportunity. It was for the breeders to improve their breeds. He deprecated any effort being made to curtail breeds if breeders wished to show at the Society's shows.

Mr. ROLAND BURKE, in moving the adoption of the Report of the SHOWS AND WORKS Committee, alluded to the paragraph in it in reference to the sub-committee which had been formed to go into the question of publicity and of advertising the Show. All would agree that an improvement could be made in publicity generally, and the sub-committee were very ready to help in some new scheme. That was really the reason for the formation of the sub-committee.

Major CLIVE BARNES said he had heard no mention as to whether there was to be a Dog Show at Derby.

Mr. BURKE replied that there had been a tentative proposal from the Derby

Canine Society. The matter wanted very carefully going into, and he was not in a position to make any statement at the moment.

Mr. GLOSSOP desired to say one word on the question of the supply of licensed refreshments at the Royal Show. It was a great pity, he thought, that at every Royal Show only one brand of beer was on supply. Generally speaking, English barley malted into English beer was produced within some 50 or 100 miles of a Show, and it would be very helpful to farmers in different parts of the country if, in the new contract with the caterers in 1934, the Society stipulated that the beer should be bought from a brewery within the locality of the showground. It was of vast importance to the local barley growers that the Society should do all it could to boost the local beer. If the general public coming to a show could only obtain a popular brand of beer it was discouraging the consumption of local beer and retarding the market for the barley of the farmers in the locality.

Sir ARTHUR HAZLERIGG suggested that the name of Sir Douglas Newton should be added to the Showyard Works Committee, because it would be better for Sir Douglas to bring his various suggestions about dog racing, and so on, before that Committee, which could then deal with them rather than Sir Douglas taking up the time of the Council. He thought a man with such an active mind as Sir Douglas would be a very valuable addition to the Committee.

Mr. A. C. NICHOLSON desired to take the opportunity of thanking the Council as a member of an association which included amongst its members most important manufacturers of implements and road-making machinery, for the opportunity the Council had given him of serving on the Council of the Society, and of representing their interests on the Implement and Showyard Works Committees. His Show Committee had had an opportunity of meeting the Implement Committee earlier in the year, and it was very gratifying to his Association for him to be able to say that after that meeting one of their suggestions had been followed up and had resulted in a reduction in the price of shedding next year. His Association's aim was to assist the Show Committee in every way they could, and to make the "Royal" the big Show of the year both from the point of view of attendance and also from the point of view of commercial success. He would not like the present opportunity to pass of thanking the Council for the gesture they had made in the direction of his Association.

Lord DARESBURY, in moving the adoption of the Report of the SELECTION AND GENERAL PURPOSES Committee, said he was sure all the members would be very pleased that the Duke of Devonshire had consented to be President next year. (Hear, hear.) The Duke was very popular on the Council; he had been on it a long time, he was very popular in the county of Derby and had a great deal of influence there. The Duke had been President at Newcastle, where the Society had once made a substantial profit on the Show, and he hoped that profit would be made again next year.

The PRESIDENT desired to re-echo what Lord Daresbury had said with regard to the Duke of Devonshire. He thought the Duke took a greater interest in the Royal Agricultural Society and its well-being, and in its activities, than in any other concern, and he was glad to hear that the Duke was to be their President in the year to come.

Mr. ROLAND BURKE returned his sincere thanks for the confidence the members had placed in him by again re-electing him as Honorary Director of the Show. He desired to take the opportunity of thanking very sincerely the members of the Council and Stewards who had acted at the Southampton Show for the very ready help they had given him. He had received nothing but kindness and help from everyone, and he was most sincerely grateful. He wished to endorse what Lord Daresbury had said with regard to the nomination of the Duke of Devonshire as President. It had been received with the very greatest satisfaction in the county of Derby, and it would have a great influence in bringing about the success of the Show there. There was a very great feeling of enthusiasm for the Show, and he had every confidence that they would have not only a very good Show but a successful one.

Mr. BURKITT, in moving the adoption of the DAIRY AND PRODUCE Committee's Report, explained the alteration in the butter-making competition. They had tried

to encourage a little local interest, but it had not been a success in the last two years. At the same time, if the Derby Local Committee felt there ought to be a local competition, and was prepared to help in that direction, the Committee would be prepared to reinstate that local class next year.

Sir MERRIK BURRELL, in moving the adoption of the Report of the RESEARCH Committee, desired to assure the Finance Committee that the Research Committee would make every possible effort to carry on its work with the greatest economy; but the Council would realise that in research work experiments had to run over a course of years. Practically all the work which was being done at present was work which had been in progress for some years, and part of it was nearing completion. He very much hoped that the Finance Committee would make it possible for the Research Committee to be able to carry on the work already in progress, because it was hardly economy to stop an experiment when it was nearing completion, and throw away the results of the money already spent on it. The policy which the Committee had decided upon was to carry on the work in progress with the greatest possible economy, but undertaking no fresh expenditure of any kind until times got better.

Sir MERRIK BURRELL, in presenting the Report of the QUARANTINE STATION Committee, said as the members knew they had lost their manager, who had taken on the management of His Majesty's farms at Windsor. They had appointed his eldest son temporarily in his place. He could report from his visits to the station, with its largish head of stock going through, that the station was running smoothly and was as clean and as efficient as in the man's father's time. He hoped, therefore, that young Ritchie would be able to follow in his father's footsteps. It was a responsible post, and it was absolutely important that there should be a thoroughly reliable man there. He should like to express his thanks, and he thought the thanks of the Council as well, to Sir John Gilmour and Sir Douglas Newton for the representations they had made to the Ottawa Conference in order to get Canada to recognise the quarantine station. Representations had been made to the United States Governments pointing out that this quarantine station had proved itself to be an absolute safeguard against exporting foot-and-mouth disease from this country. It had been the United States' objections that held Canada up from recognising the station to a very large extent. Their objections had been overcome, and he was glad to be able to say that Canada, receiving also certain concessions as regarded the importation of her cattle into the United Kingdom, would in future recognise this country's system of quarantine. That only left New Zealand, who had not yet consented to recognise it. At one time the station was at a low ebb—almost at the derisory low ebb of one goat, but he was glad to say that during the last month the station had been absolutely full, and there was a considerable promise of animals going through next month, and he hoped as things improved throughout the world that our export trade would go back to where it had been.

Sir DOUGLAS NEWTON thanked the Chairman of the Committee for his courteous reference to himself which he appreciated. With regard to the present position in respect of export of pedigree cattle from this country so far as Canada was concerned, perhaps he might be permitted to make some very brief remarks. The old position had been—the pre-Ottawa Conference position—that before any stock could be exported from this country into Canada we had to be free from any outbreak of foot-and-mouth disease for 60 days. Then 30 days' quarantine was imposed on beasts when they were taken to Canada. As a result of that, largely, our exports so far as Canada was concerned in 1929 had been 340 head; in 1930, 232 head; and in 1931, 76 head, and they looked like dying away altogether. The new position, as a result of the Conference, was that there were 14 days' quarantine on this side and 14 days' Canadian quarantine. Therefore there was some reduction in the period of quarantine. An important point was that outbreaks of foot-and-mouth disease, if localised, in future were not to be regarded as an absolute bar to admission of our pedigree cattle. Substantial progress had been made in that direction, and that, coupled with the meat policy, he hoped would lead to an enhanced demand for our pedigree cattle.

The PRESIDENT said the Council would agree that they were very greatly indebted to Sir Merrik for his interest and continuous activity in connection with the

Quarantine Station. Sir Merrik's interest had largely contributed to the station's success from the beginning.

Mr. QUESTED raised a point with regard to the export certificates issued to South America which affected this country's exports rather adversely. Previously the Argentine Consulate used to charge a guinea per certificate. Representations were made to the Argentine Government, and accepted, to issue what was called a collective certificate, which was made up by the secretaries of the different breed societies, and was accepted by the Consul, and which cost a guinea only for ten, twenty or thirty certificates. The Council would appreciate that in these hard times when one was exporting 20 or 30 sheep or a dozen bulls it came rather hard to have to pay a guinea for each certificate. He would be glad if the Council could see its way clear to write a letter asking for a reversion to the collective certificate system.

The PRESIDENT pointed out that there was now no quorum present, but a note would be made of Mr. Quested's point.

Mr. QUESTED asked if he could bring up the matter before the next meeting of the Stock Prizes Committee?

The PRESIDENT replied in the affirmative.

WEDNESDAY, DECEMBER 7, 1932.

LORD MILDMAY OF FLETE (President) in the Chair.

Mr. Ernest John Manners of the Old Hall, Netherseale, Burton-on-Trent, was elected as a Governor, and fifteen new Members were admitted into the Society.

Mr. ADEANE moved the adoption of the FINANCE Committee's Report with the exception of the paragraph dealing with the Show Accounts, to which he intended to refer later. It was proposed to reduce the entrance charge from 10s. to 5s. on the first day of the Show. In doing that they were going back to the charge made at Darlington in 1920, and it was to be hoped that the result would be to increase the "gate" on the first day.

With regard to the reduction in the membership of the Society, this really was a very serious matter. The reduction went on increasing year by year, and he wished again to draw the attention of the Council to the matter and ask them to do what they could to remedy this state of affairs. During 1930 a shrinkage of membership of 359 was shown; during 1931, a shrinkage of 538; and during 1932, a shrinkage of 620.

The Report, except for the paragraph dealing with the Show Accounts, was adopted.

Mr. ADEANE, in moving the Financial Statement on the Show, said that it was difficult to compare the Show at Southampton with other Shows, because the conditions were wholly different. The Show was held outside the borough, and it was found to be impossible for Southampton to undertake the responsibilities, financial and other, which were generally borne by the locality. It was, therefore, found necessary to make it an *area* Show, and the counties of Hampshire, Wiltshire, Sussex and Dorset were asked to co-operate with Southampton for this purpose. This they did willingly, and a central committee was set up which enabled the Society to hold the Show in the South of England as desired. To that committee they were much indebted. (Hear, hear.) They all knew that the Show would not be a financial success, and the Bath and West and Royal Counties Societies holding their Shows, one at Yeovil and the other at Guildford, did not improve the prospects. The expenditure totalled £40,927, and the receipts £33,125, leaving a loss of £7,802. This compared with the loss at Warwick of £3,297. The loss would have been much greater but for the economical management of the Show, for which their thanks were principally due to the Honorary Director and the Secretary. (Hear, hear.)

There was a saving of £2,741 on the cost of erection and maintenance of the Showyard; of £529 on the police, and, mainly owing to the reduced entry of stock, the amount of prizes awarded was less by £1,369.

On the receipts side the greatest reduction in comparison with Warwick was in admissions to the Showyard, which totalled £6,330, as against £10,459 at War-

wick. The receipts from shedding and space fees were down by £2,110, and fees from entries of stock by £1,062, but these decreases were partly offset by the reduced cost of the shedding provided. He was glad to say that the Society could meet the Show deficit without encroaching on its reserves, by appropriating the £3,500 put aside against loss on the Show, and taking the balance of £4,302 from the amount they had carried forward on deposit account. A loss of this magnitude, however, was a strain on the finances of the Society, and it was to be hoped that the Show at Derby would give a different result. (Hear, hear.)

The Society had again been very fortunate in its President, whose great courtesy at all times and marked ability in the conduct of the affairs of the Council had been appreciated by all the members. (Applause.)

Although the Show was not profitable, it was in every other way successful, and the hospitality of the southern counties enabled the Society to visit the South of England for the first time for many years. The visit of the Duke and Duchess of York was welcomed by everybody, and without doubt added very much to the "gate." (Applause.)

He thought they should pass a special vote of thanks to the Central Committee, which was composed of representatives of Southampton and the counties of Hampshire, Wiltshire, Sussex and Dorset, and also to the Local Committees in each of those counties. They had had anything but an easy time, and without their assistance the Show could not have been held. To produce a Show of the magnitude of the "Royal" required great ability in organisation, and a good many other qualities as well, and they were fortunate in having an Honorary Director who had all those qualifications. (Hear, hear.) Their thanks were due to him, to the Secretary who had backed him up on every occasion, and to the staff. (Applause.)

The President said that the Council would feel greatly indebted to the Honorary Director and the Secretary for their admirable efforts to reduce expenditure. The Society was indebted also, as Mr. Adeane had said, to the Local Committee, which was specially active in helping the Society so far as it was able to do so. The altogether too kind terms in which allusion had been made to himself made him almost hesitate to put the Report to the meeting.

LORD CORNWALLIS, in moving the adoption of the JOURNAL AND EDUCATION Committee's Report, said that he desired to make a caveat. There was one paragraph (No. 3) in that Report which he thought should not go further than the Council, and he had no doubt that the Secretary would take steps to see that paragraphs of that nature were not printed for general circulation. The Council was aware, of course, that its proceedings were now reported at greater length.

SIR ARTHUR HAZLERIGG called attention to the remark in the Report that The Crypt House Press would take over the bound copies of the Journal. What he thought was intended to be said was that the new printers might be able to take them over.

LORD CORNWALLIS said that the reference was not to bound copies, but to bindings, in case any members, who had the paper volumes, desired to have them bound. The old printers, with a view to helping the Society, had in their stocks some 300 or 400 of these binding cases—not volumes—and had asked whether the Society would purchase them. That was a matter which the Committee thought should be arranged between the old printers and the new. He would see that the paragraph in question was made clear in the Report of the Committee.

In moving the adoption of the CHEMICAL Committee's Report, MR. FRANK SMITH said that perhaps he might be allowed to mention that although the samples sent to the Chemical Department were not so numerous as they had been in years past, yet he thought it would be agreed that the Committee was assisting some members who were finding that they were paying as much as £100 a ton for their feeding stuffs more than was necessary! It would be helpful also to members, when considering how they could improve their grass mixture, to learn that what they were buying was really of very little value, consisting of about 70 per cent. of sand and 30 per cent. of iron filings. (Laughter.)

LORD HASTINGS said that there were two points he desired to refer to in moving the adoption of the Report of the BOTANICAL AND ZOOLOGICAL (Forestry and Orchards) Committee. The entries for exhibition in the Forestry tent had been ante-dated to March 1st. That, of course, was much earlier than any other entries were accepted, but it had been found in practice that there was now a very healthy competition for exhibition in that tent, and obviously it took time for those who were exhibiting to prepare their exhibits. It had been felt that it would be a great convenience, therefore, both to the Committee and to intending exhibitors if the Committee were enabled to make its selection much earlier and to acquaint those who had been accepted of the fact of acceptance. To delay matters until May 20th, as in the past, was very inconvenient all round. He hoped the Council would agree to what was definitely a departure in a wise direction.

The other point he desired to refer to was in connection with the Orchards and Fruit Plantations Competition Sub-Committee. Mr. Thomas Neame had been good enough to take the chair of that Sub-Committee. Col. Wheeler, he regretted to say, had been exceedingly unwell, and decided to retire from that position, which he himself inaugurated, and for which he had made himself responsible for a number of years. He was glad to note that Col. Wheeler had permitted himself to be re-elected on the Council, and they might reasonably hope to see him again as they had seen him in the past; but he had felt himself in his present state of health unable to carry on as he had done. The Council might congratulate itself on having secured the services of a gentleman so expert as Mr. Neame, and he was very grateful to him for having accepted. (Applause.)

SIR MERRICK BURRELL, in moving the adoption of the VETERINARY Committee's Report, reminded the Council that some two years ago it appointed Sir Archibald Weigall as its representative on a Committee of the People's League of Health, which had been set up to examine the incidence of bovine tuberculosis amongst humans, and how best the danger of that disease might be obviated or diminished. They were all indebted to Sir Archibald Weigall for the great amount of work he had put in on this important and controversial subject. Before asking him to make a few remarks to the Council on the work done, he suggested that the Secretary be instructed to obtain sufficient copies of the printed report of that Committee for circulation to every member of the Council. He himself had read the report through twice, and thought it a very important document. Before anyone made up his mind on the question brought forward, he should consider the recommendations made in the report, and the report as a whole would repay a very careful perusal.

SIR ARCHIBALD WEIGALL said that the Committee referred to was set up some three years ago, and so far as its personnel was concerned it was as comprehensive and representative a body as it was possible to get together. It included distinguished members of the medical and veterinary professions, representatives of the milk distributing agencies, as, for example, United Dairies Ltd., the local authorities, and, if he might humbly say so, of enlightened milk production as represented by the National Research Institute in Dairying and the milk recording societies of the country. After its long but interesting and absorbing work, five facts had emerged. The first of these was the appalling prevalence of bovine tuberculosis in the country to-day, and the havoc, both human and bovine, for which it was responsible. The second was the amazing apathy and ignorance of the public in general as to what was now going on all around them. The third was the total failure of the Tuberculosis Order, 1925, even to stay the trouble, much less eradicate it. The fourth was the impossibility of expecting uniform efficiency if administration of this kind were allowed to remain in the hands of local authorities. Some authorities were splendidly energetic and sympathetic; others were apathetic and parsimonious. Finally, the remarkable fact came out that in pasteurisation, if carried out by what was known as the holding method, there was no diminution in the food value of the article at all. Those were the five factors which certainly impressed him enormously.

The Committee had arrived at a report, and he would not weary the Council

with all its conclusions. The only one to which he committed himself was that the Government of the day should be recommended to allow only large municipalities to have the permissive power, after submitting to various inquiries, of requiring by statute that all milk other than tuberculin-tested milk consumed within their municipal boundaries should first be pasteurised.

A fortnight ago, with Sir Thomas Horder, Lord Moynehan, Prof. Hobday, and others, he interviewed the Ministers of Agriculture and of Health on the subject of this report. He hoped that special notice would be taken of the point he was now about to make. Before the representatives of those two Ministries he made it perfectly clear that, although he was representing the Royal Agricultural Society on the Committee, whatever he said could only be laid at his own individual door, and that neither the advocates nor the opponents of this particular recommendation could claim the Royal Agricultural Society as on either the one side or the other. He said that for this very good reason, that the Council of this Society had not seen the report, and even if they had, they could not have expressed any opinion on it, owing to the fact that, because of the Charter, they were not allowed to discuss any question which had become embryo legislation.

He said this because they had been informed that there were already maturing among private Bills in the House of Commons a Bill by Manchester and another by Glasgow with clauses inserted asking for this permissive power. Therefore this had become a matter of embryo legislation. He suggested to the Ministers, that being so, that this great Society could not even consider or express an opinion on the matter, and he hoped the Press would take particular note of that disclaimer, so that the Royal Agricultural Society's Council could not be quoted either in the near or distant future in connection with this matter. (Hear, hear.)

He wished only to add that as a result of his experience on this Committee he hoped that the Government would waste no more time in setting up either committees or commissions on this subject. For thirteen years now they had had a report before them which was as true to-day as when it was issued. He referred to the report of the Committee on the Production and Distribution of Milk. That committee also sat for two years, with himself as Deputy-Chairman, and it recommended that the whole of this question should be dealt with at the source, and not in this "half-way-house" manner. It recommended a test with stabilised tuberculin, a uniform application and interpretation of the test, and that the veterinary surgeons concerned should be wholly responsible to the Ministry of Agriculture, also that the matter should be carried as far as finance and discipline were concerned on the estimates of the Ministry, and outside any local authority administration whatever. It was a matter of the greatest regret that on a question of paramount importance to both producer and consumer that great Council was precluded by the Charter of the Society from giving any assistance to those who were concerned to implement legislation. (Hear, hear.)

Sir WILLIAM DAMPIER wished to assure the Council that the Agricultural Research Council had the subject of animal diseases in general under very close consideration. It had set up committees of experts to cover a certain number of diseases, which they thought were likely to become worse if the animal population of the country should increase. Among these committees was a joint one of the Agricultural Research Council and the Medical Research Council on the subject of tuberculosis. They welcomed, of course, the excellent work which had been just described by Sir Archibald Weigall. Besides the Tuberculosis Joint Committee of the Medical and Agricultural Research Councils the Economic Advisory Council had also, he understood, set up a committee to consider cattle diseases in general. This committee was to be chiefly concerned with administration rather than with research, but he wished the Council to know that all these various lines of attack were going forward, and that the Agricultural Research Council considered the subject of animal diseases one of the most important, if not the most important, of the many subjects which were under its purview.

Sir MERRIK BURRELL desired to make one point a little plainer. From what Sir Archibald Weigall had said it might be inferred that if the Council could have no voice in this matter, owing to its Charter, it was not much good wasting time

in circulating and reading the report. That, however, was not his view. There was a great deal in the report on which the Council could well express an opinion. The only point on which they might be debarred—he was not perfectly sure that they were—was this question of giving local authorities power to insist on all milk coming into their areas being pasteurised; but on everything else in the report he thought the Council could, if it wished, quite well discuss it and express an opinion to the Ministries concerned. Therefore, he desired to move that the Secretary be instructed to obtain the reports and circulate them to the Members of Council.

Mr. BURKITT said that it was very difficult to discuss this question because members had not the report available. But he wished to assure Sir Archibald Weigall that if it was correct as he had stated—a statement which he had heard with some little surprise—that milk could be pasteurised without any loss of food value, the ground of those who objected to pasteurisation had been out away from under their feet. He thought that if this statement were correct, the farmers would not oppose the measure.

Mr. NEAME said that he was co-opted on the Committee of the People's League of Health, and he was one of the few who found themselves unable to support the recommendation particularly as it referred to the permissive power to compel pasteurisation of milk. He had been a producer of just milk, "Grade A" milk, and certified milk, and all the way through he had been intensely keen that the milk of this country should be produced in a clean manner. Sir Archibald Weigall had said that pasteurisation would not affect the food value of the milk, and Mr. Burkitt had said that if this was so he would withdraw any objection to what was proposed. But there was another aspect to consider. If pasteurisation did not affect the food value of milk, at the same time it did not make a dirty milk clean, and what he did fear was that if these powers were taken the result would be a very retrograde one on the production of clean milk in this country. An incident which happened ten years ago stood out clearly in his memory. He was serving at that time on his county Milk Recording Committee. There was a very enthusiastic farmer there who was trying to produce better milk, but, he said afterwards, "I saw my milk thrown into the container with everybody else's milk, dirty or clean. It was all put together." And that had the effect of discouraging this man's efforts to produce clean milk. He felt that if pasteurisation were imposed, the effort to obtain a clean supply of milk—he was referring not to the tuberculous infection, but to the physical cleanliness of the milk—might be very seriously impeded. He begged for careful consideration before any such proposal was supported.

The PRESIDENT said that their most hearty thanks were due to Sir Archibald Weigall for his efficient services on the Committee as the representative of the Society. Sir Archibald had very rightly pointed out that on so important a question the members of the Council must see the report before it could be said that they were prepared to endorse its recommendations. All that had been said by subsequent speakers showed how necessary it was that the Council should not be said to approve the report before it had had an opportunity of examining it.

Mr. ROLAND BURKE having moved the adoption of the Report of the SHOWYARD WORKS Committee,

Mr. GLOSSOP asked with regard to the permission given to the Derbyshire Women's League for space in the Showyard for the Children's Hospital, whether this would entail the selling of flags.

Mr. BURKE said that it would mean only the provision of a very small tent, and there would be no selling of flags in the ground at all.

The PRESIDENT said that the Council would wish him to extend a warm welcome to the new members who were present that day for the first time. Lord Shaftesbury, an old friend, had been returned for Dorset; Captain J. B. Scott had been elected for Hampshire, and Mr. James Kilpatrick was there from Scotland.

Mr. BURKITT, in moving the adoption of the DAIRY AND PRODUCE Committee's Report, said there were two points that he wished to bring to the attention of the Council. The first was with regard to the butter tests. Some

time ago the Council decided that owing to the quality of the butter often being unsatisfactory, an extra ten points for quality of butter should be granted. His Committee went a little further than this, and recommended that where the butter was absolutely unmakeable, the particular cow should be disqualified. There had been two cases of this kind within the last four years, in each case with a champion cow, whose milk it was almost impossible to churn. After all, a butter test should be a butter test, and not merely a butter fat test. The ten points were now added for the quality of the butter. The present points were that no heifer or young cow should receive an award unless there was a minimum of 28 points, and no older cow unless there was a minimum of 32. The Committee raised this by six points, and it was considered that if the cow got six out of a possible ten points, the butter should be deemed satisfactory.

The other point bore on the quality of milk. Here they were greatly indebted to Dr. Voelcker, who had helped the Committee out of his long experience. Up to the present, as those of them would know who served on the Bench, when there was evidence which stated that in the opinion of the analyst a sample was said to contain what was equal to, say, 20 per cent. of added water, very often, although the milk was below the standard, there had never been, in fact, any added water, and it might be that an upright and honest man was penalised in that respect merely because his milk was below the standard, probably owing to the poorness of his pastures or some other cause such as that. The Committee had felt that in the case of a man known to be a decent sort of fellow, to proceed immediately on the analyst's report would only have the effect of arousing sympathy for him, which might not always be desirable. Therefore they suggested that Dr. Voelcker's recommendations should be adopted, namely, that the analyst should state one of three things: either first, this particular sample of milk might have been deprived of some of its fat; or secondly, it was merely below standard for some reason such as poor pasturage; or thirdly, and quite definitely, water had been added. A certificate such as that, presented to a Bench of magistrates, would materially aid them in their decisions and be much more satisfactory.

Sir MERRIK BURRELL, in moving the adoption of the Report of the RESEARCH Committee said he desired to give a short word of explanation with regard to the suggestion that the award of the Medal should be discontinued. The Committee regretted very much to have to make any recommendations of the sort, which limited the work of the Society in that particular educational direction. The scheme had been started in 1912 with a view to encouraging young men to do original agricultural research work. It had been dropped during the war, and had been resuscitated in 1922. It had at times produced some quite good work, and the Society had rewarded that good work by the presentation of the Medal, but it was by no means certain that that kind of work would not have been produced without the encouragement of the Medal. There had been no work submitted which had been considered worthy of the Medal in the years 1925, 1927 and 1928. During the years since the war the conditions of agricultural education and research had been entirely altered, and the incentive to do research work among the younger men really came now from those professors and principals of the various colleges who were educating them. The results of any good work done by the younger men was, as a rule, nowadays published in scientific and semi-scientific journals which were issued monthly and quarterly. Therefore these young men got the kudos of any good work they did at once, instead of having to wait possibly a year until the Society had decided whether their work was good enough to receive the Medal. In other words, the Committee thought that the object of the Medal had rather dwindled in that it was no longer extracting out of the younger men the work for which the Medal had been originally intended. With great regret, therefore, the Committee felt that it was advisable to discontinue the award of the Medal at any rate in its present form.

Mr. BURRELL confirmed what Sir Merrik had said, and added that the research essays had been received on most widely differing subjects. Some of them were really excellent, but they did not display research. They displayed

amount of industry and application, but not original research. There had been a most excellent essay on the canning of fruit and vegetables, and another on the incidence of disease in Irish and Canadian cattle. One leading essay had been that on the inheritance of milking factors in dairy cattle—very valuable but not new, and another leading essay had been on the question of the grass land in the Market Harborough district from the point of view of feeding cattle. It was a monument of industry, meticulous care and observation, but it was not really research. He quite agreed with the remark that research work was now rewarded in other directions, and that the time had now come when the Medal should be withdrawn.

LORD HASTINGS said there was something he would like to put forward, on a matter which did not directly concern the Report, but which he thought would be agreed arose out of it. It had been proved now, after long experience, that the Medal, which had been instituted not so much originally as a reward for good work done but as an incentive to have good work done, had served its purpose, and that it was no longer necessary that the Society should continue to expend both the money and time which was involved by the award of the Medal. If that was agreed, he was wondering if the time had not come when the Society might suitably turn its attention to the granting of an important Medal for good outstanding work in agricultural research. The Royal Agricultural Society was quite clearly in the position to do what he suggested might perhaps be desirable to be done. It was not necessary for him to emphasise at that meeting the fact that the Society which they were all proud to serve was the one outstanding Society concerned not only with the practical side of agriculture but with the scientific side. It could not be denied that the Society was qualified to do as he suggested, and if that were so it occurred to him that a Medal awarded by the Society for the class of work he had in mind would rank, and very properly rank, with the Medal which was now awarded by the Royal Society for scientific work in all its branches. It would rank, in a way, with the grant of the Nobel Prize. In fact, it would be the one outstanding reward which those who had devoted a long period to a particular kind of research would look to as their ultimate reward. That was quite the reverse process to that which had been hitherto adopted in respect of the Silver Medal, which had been instituted with the idea of extracting good work, and not so much with the idea of rewarding it. His idea now would be not to use any further endeavours to extract research work—there were so many incentives nowadays existing that it was no longer necessary for the Society to attempt it—but to reward such work. It was a foregone conclusion, no doubt, that it would be an elder man in agricultural science and research who would be the recipient of the award. It passed from the encouragement of the younger generation to the encouragement of the elder. It was a different principle, but he did think that it was one which might well be considered now. He was not suggesting that an instant decision should be reached in so important a matter at that Council meeting. What he did suggest was that it was a subject for reflection by the general body of the Council, and for the most careful consideration by the Research Committee. He felt the Research Committee would be hardly justified in giving the matter consideration unless there were some kind of preliminary approval by the Council of the idea, and it was with that notion in mind that he ventured to ventilate the idea.

THE PRESIDENT thought there was a good deal to be said for the representations which had been made by Lord Hastings. It seemed to him that the first thing to be done was for the matter to be considered by the Committee.

SIR MERRIK BURRELL said the Committee would be only too glad to take that as an instruction.

The following Standing Committees were reappointed for 1933 :—Finance, Journal and Education, Chemical, Botanical and Zoological (Forestry and Orchards), Veterinary, Stock Prizes, Judges Selection, Implement, Showyard Works, General Show, Selection and General Purposes, Dairy and Produce, Horticultural, and Research.

Proceedings at the Annual General Meeting of Governors and Members

HELD AT THE ROYAL AGRICULTURAL HALL, ISLINGTON, N.

WEDNESDAY, DECEMBER 7, 1932.

LORD MILDMAY OF FLETE (PRESIDENT) IN THE CHAIR.

Chairman's Opening Remarks.

The PRESIDENT: My Lords, Ladies and Gentlemen, it gives me the greatest possible pleasure to preside over this Annual General Meeting of the Royal Agricultural Society of England, but that pleasure is tinged with a certain amount of regret in view of the fact that I am resigning my position very shortly. You all know that the Duke of Devonshire has been designated as my successor. You will agree that, from every point of view and especially from the point of view of Derby, the choice could not have been bettered. (Hear, hear.) The Duke's public interests are many, but I really doubt whether there is any institution in which he takes a more heartfelt interest than in the Royal Agricultural Society. (Hear, hear.) I doubt whether there is any Member of the Council who is more solicitous for the success and prosperity of the Royal than the Duke; and at a time when difficulties are thickly assailing the agricultural world and when it is essential that this Society should stand firm as a rallying point for agricultural endeavour and initiative, we are lucky indeed to be able to command the services as President of so influential and highly respected a man as the Duke. (Hear, hear.)

Looking for one moment at the Report of the Council, it must have caused you satisfaction and gratification in these very difficult times to see that the Society has been able to carry on the work and the Show uninterrupted. At the same time there is room for considerable regret that present-day circumstances have so affected the membership of the Society and the attendances at the Show. In both these respects there has been a very considerable diminution. The Royal Show need fear no rival. I greatly enjoyed the Southampton Show. The display of stock was magnificent. Such a thing could be seen in no other part of the world. (Hear, hear.) No wonder breeders of stock from all the world over come to the Show in their desire to replenish their stock. For the visit of Their Royal Highnesses the Duke and Duchess of York we were all extremely grateful. I think there was something really attractive about their eager delight in all that they saw, and in their anxiety to see more and more in the comparatively short time allotted to their stay. I took upon myself the right, on behalf of the Society, to write to H.R.H. the Duke of York and to tell him how grateful we were, how much we admired his keenness in the interests of agriculture, and how much beholden we were to him and to the Duchess for their kindness in coming so far to further our interests. (Hear, hear.)

The circumstances attending the holding of the Southampton Show were in many respects extremely difficult from the beginning. There were many obstacles, not usually forthcoming, which had to be overcome. In the first place it was very difficult to obtain an adequate site and, the site having been procured, it was still more difficult to obtain the requisite public services. Indeed, many of you may remember that in the Press there appeared a rumour that the Show of 1932 was going to be abandoned. Of course, it was necessary to contradict that rumour most emphatically. Anyhow, the Royal Show at Southampton was a great success in every way except with regard to the attendance of the public. I know you are so loyal to the Society, and render it assistance in so many ways, that it is unnecessary for me to impress upon you the need for your active and generous support in the future.

With further reference to support, I took a very great interest, as doubtless you did, in the young farmers' cattle judging competition. For the first time

microphones and loud-speakers were installed so that spectators at the ring-side could hear the reasons given by the competitors for their placing of the animals. That competition resulted in a very great success for Great Britain. We got first prize, and we defeated the United States of America and the North of Ireland. The women were very much to the fore in this competition, as they are indeed in all walks of life now, and I think that a lady defeated all those in her own class. I suppose we must expect that mere man takes a second place in these days. The one thing I regretted was that the public did not take more interest in the presentation of the prizes in this connection in the central ring. Perhaps it was because they did not know what was going on. If that be so we shall take action to rectify that position in the future.

The Report shows how anxious we have been to ease the position for implement makers, who have had a very lean time lately. We have wished to consult their interests, for we recognise how important a feature of the Show is the display provided by the implement makers.

Reference has been made in the Report to pigs—the urgent necessity that the Agricultural Research Council should make scientific study of the diseases affecting the pig. Things are stirring in the pig world, and very rightly so. There is a feeling growing that the breeding and rearing of pigs is worthy of the closest attention. Our Council has recognised this to the full, and has been devoting its attention to developments in this direction. We are going to keep our eye upon those developments, for we know well what great possibilities there may be.

In the paragraph in the Report which refers to the Quarantine Station there is a very great deal more than meets the eye. The Royal Agricultural Society was asked by the Government authorities to undertake the administration of that station. We accepted that responsibility, and I am glad to think that that station has been most admirably administered to the admiration of all who made use of it. In that connection we owe very much to Sir Merrik Burrell and to Mr. Ritchie. (Hear, hear.)

Paragraph 84 speaks of Ottawa. If the President were to begin to name all those to whom the Society is indebted and has good cause to be grateful there would be no end to his speech, but I think I am fully justified in singling out one name as especially worthy of recognition—that of Sir Arthur Hazlerigg. (Applause.) At great personal inconvenience he acceded to our wish that he should act as representative of the Society on the advisory committee which sat at the Ministry of Agriculture, and he was sent there to give full information in the agricultural interests to those who went to represent the industry at Ottawa. It was no easy task, but most admirably and strongly did Sir Arthur discharge his duty. He is a man who does an immense amount of work. He is a man of sturdy frame, and I am glad to think that he is no worse for it. In fact, he is a very great deal better to-day than he was at the meeting last year, when he had lost his voice and we were rather concerned about him. Long may he render us valuable service with undiminished vigour. (Applause.)

You learn from the Report of the intention to visit Derby next year. I am told that our Show there is likely to have the most hearty support. The assistance proffered by the town and county of Derby is already most encouraging. I myself the night before last at the dinner to the Breed Societies' Secretaries met the Mayor of Derby, and a few minutes' conversation with him convinced me of his intention to do his very utmost to work unceasingly to make our Show a success. All looks well in that direction. Lord Daresbury would tell us that Derby was the salvation of the Society after the terrible experiences at Park Royal in 1905. The last Show held there was in 1921 and was an outstanding success from every point of view. A most representative Local Committee has been formed in Derby representative of the town and county, with the Duke of Devonshire at its head. The Derbyshire Agricultural Society has decided to suspend its own Show for the year and is supporting the Royal with grants of money and with promised entries of stock, in return for certain privileges which we are to give to their members.

The Breed Societies have earned our warm gratitude by continuing their financial contribution—a very substantial contribution—to our Prize-sheet. I am

bold enough to say that, given anything like good weather, the Derby Show is already assured of success.

But do not forget the Society stands in need of a large number of new members as well as of exhibitors. I would ask you to do all you can to secure them. This is not a formal request to be renewed year after year. We must have more members if the Society is to continue to prosper. What we should aim at at present is to raise our members from 9,700, at which they are at present, to at least 13,600, which was the record number in the year 1925.

I had hoped to present to-day the Medal and Prize to the writer of the essay on original research offered each year by the Society. Those who are allotting this Prize have not been able to give us their decision yet, and so I am unable to do so.

When I took over the Presidency a year ago I expressed the hope that during my term of office the clouds which were weighing so heavily on agriculture might be lifted. Well, that has not come about. But look hard with me and you will see that there is a patch of blue in the thunder clouds. I still frequent my old haunts in the House of Commons, and in moving about there I find there is a new spirit. You can feel it—a spirit which I never felt during the 37 years that I sat in the House of Commons. For the first time it is being realised unanimously by members of all parties in the House that agriculture must be rescued from the appalling position resulting from neglect, and something worse. (Applause.) I know the Minister of Agriculture very well. I was in the House of Commons for 13 years with him, and I may tell you that my optimism is strongly stimulated by the personality of the Minister (hear, hear), and especially by what he said last night at the Dinner of the Farmers' Club—particularly two sentences which I took down. He said: "No longer does the House of Commons uphold the theory that cheapness is the greatest god of the human race." And again: "We must put an end to the cataract of bankrupt stock thrown upon our markets from abroad." I was so impressed by those two sentences that I took them down at once. From what I know of the Minister (and I do know something about him) he is a strong man. He means what he says. He can be trusted to stand by us, and with such a leader we can have confidence for the future. At long last a genuine effort is being made to do justice to those who get their living from the land, and I have very high hopes of what may be the result.

Now comes the time for me to lay down my responsibilities as President of the Royal—responsibilities which, beforehand, I greatly feared but responsibilities which I have greatly enjoyed owing to the kindness of all the Council with whom I have been brought into contact. I could have wished to have had another year of office, only for the reason that with the experience I have gained I feel that I might have done so very much better than I have done. To the Council I add my warm thanks, and especially to the elder statesmen of the Council, the Chairmen of the various Committees. They have been very helpful to me, and as for Mr. Burke, the Director of the Show, and the Secretary, Mr. Turner, you all know how quite invaluable is their work in connection not only with the Show but with all the activities of the Royal Agricultural Society. (Applause.) I can only say that no less invaluable have they been to me in private ways which you have not seen. I am deeply grateful to them.

Gentlemen, I thank you for having given me such a happy year. (Applause.)

Accounts.

The balance-sheet was duly presented.

Adoption of Report.

The PRESIDENT: The Report has been printed and circulated through the post to every member of the Society, and I think you will probably be willing to take it as read? (Agreed.)

Mr. J. MONTGOMERY HATTRICK : My Lords, Ladies and Gentlemen, it is with much pleasure, and with deep appreciation of the honour you do me in asking me to move this Resolution, that I rise to do so. Our President has reviewed the Report of the Council very fully, and has left me very little to say in the way of comments upon it. I should like, however, to say that I also visited the Royal Show this year—as in fact I have done for a great many years—and I can say, not only from my experience of the Royal, but also from my experience of many important Shows on the Continent and in the Dominions, that I look back with greater pleasure on the last Show than on any of the others. The exhibits were very diverse and instructive. The President has referred, in suitable terms, to the excellence of the stock. I would like to add that I was much impressed by the diversity of the exhibits in the Machinery Section (hear, hear), and not only by their diversity but by their range in the matter of time. One saw there a very primitive, but, at the same time, very efficient device for turning wood, and a few hundred yards away one could see a huge harvesting machine which, attended by four or five men, was capable of reaping, threshing, winnowing and bagging the grain from 45 acres a day.

There is one other matter to which I should like to refer, and that is the decision of the Committee of Selection and General Purposes to the effect that the Charter of the Society should not be changed. That, in my humble opinion, was a very wise decision indeed. I think there are many ways in which the activities of this Society can fulfil the terms of the Charter other than by political action.

We are all familiar with the work of the Society not only in connection with holding Shows, but also in encouraging scientific research and the application of scientific discoveries to our problems in farming. For the work of the Society in this respect no one could offer any criticism whatsoever. There is, however, one direction in which I should like to suggest that a new field of activity might be opened up for the Society. My work takes me about the country a good deal, and during the last three years I have been brought to realise more and more that the most urgent need for English farming to-day is a demand for its produce. It is difficult to find in the records of the Society's work any actual plan towards the end of creating markets, and I have a very simple suggestion to put forward, and one for which I ask your sympathetic consideration. At our Shows I know that the Show Committee impose the condition upon catering contractors that, to the utmost possible limit, the food supplied shall be home-grown. My suggestion briefly is this—that not only in the future should that condition be extended, and if possible strengthened, but also that the Society might take steps to make the fact known. It is not that one could expect any great advantage to the British farmer by the mere fact of advertising on the Show-ground itself that the food supplied there was home-grown: the object I have in mind is that there shall be created in the minds of the farmers themselves an appreciation of the value of asking for what they themselves have got to sell. That, I think, is lacking in the farmers of this country. I have been all over the country on my work, and for years I have made it a practice of asking to be supplied with home-grown food. It is quite impossible for anyone who has not tried this experiment to realise how difficult it is actually to get home-grown food. I remember on one occasion in Devonshire I asked the waiter to tell me what the breed of lamb was that he was serving. He did not know. He went to the kitchen, and he came back and said, "I am very sorry, Sir, but the cook does not know what the brand of sheep was." On another occasion in the North of Scotland I wanted to know whether the salmon on the bill of fare was Scotch salmon. The girl went away to the kitchen and came back and said, "I am sorry, but the cook cannot say where the salmon was born." I could multiply these examples for a long time. It is extraordinarily difficult to get home-grown stuff. In remote villages in Perthshire I have asked for locally-made butter, and I have been served with a blended butter which I discovered, on my return to London, consisted of very little English butter blended with butter from Australia, and also even from Siberia. That, I think, is a condition of things which the farmers themselves could do a great deal to remedy, and I should like to appeal to you all here to make up your minds to try the

experiment of asking, when away from home, where the food comes from wherever you take a meal, and of demanding, if at all possible, to be served with English-grown food. There are in this country something like 400,000 farmers in occupation of holdings of 50 acres and over, and if by any work the Society might do we could induce even a small proportion of that number of farmers to insist always, when they are travelling, on being served with home-grown food, an enormous amount could be done in increasing and creating the demand for what our farmers are growing.

I have much pleasure in moving the adoption of the Report of the Council.

Mr. JAMES HAMILTON: My Lords and Gentlemen, there is very little need for me to make any remarks with regard to the Report after what has already been said, and after the lucid description which you, Sir, have given of the Report. One is satisfied that had it not been for the very excellent work which you yourself put in, assisted by our very able Secretary and those associated with you, the adverse balance would no doubt have been even more than it is. We are indebted to all those who took an active part in the work of the last year. I am not going to refer to the Report any more than this: you mentioned the question of research in regard to the pig industry. That is quite necessary, but we hope it will not stop there, and we are pleased to see from this Report that the Spahlinger test for tuberculosis is being watched very carefully, and also that the Research Committee are still pursuing their work very carefully. We are continually up against things we cannot understand, and there is room for endless research in the agricultural world.

With regard to using home-grown stuff, we all agree with what Mr. Hattrick has said.

I have the greatest possible pleasure in seconding the motion for the adoption of the Report.

The motion was put and carried unanimously.

Election of President.

Sir ARTHUR HAZLERIGG: In the regrettable absence of Lord Desborough your President has asked me to move the election of the Duke of Devonshire as President. (Applause.) Knowing that I had no long notice, with that kindly courtesy which has endeared him to everyone of us, Lord Mildmay nearly made all my speech for me! He told you the facts about the Duke of Devonshire: why he should be our President, and in what esteem he is held in Derbyshire. I have only this to add—that if you elect the Duke to be President for the ensuing year it will be only the fifth record in nearly 100 years of an English gentleman having been elected twice as President of the Royal Agricultural Society of England. There was Mr. Philip Pusey in the early days; there was Sir John Thorold; there was Lord Middleton, and there was Sir Gilbert Greenall. The only family I can see who has held office more times than the Duke of Devonshire is our Royal Family, and I am sure I am right in saying that in Derbyshire the Duke of Devonshire comes second only to the Royal Family. (Applause.) I do not think I have ever seen anyone go round a Royal Show and enjoy it more than His Grace the Duke of Devonshire does. He looks eminently happy. He finds out things which other people do not find out. At Warwick, just as the Prince of Wales was going, he suddenly said, "Have you seen such and such a thing, Sir?" I had no notion where it was in the Show, but the Duke had found out a most extraordinarily interesting instrument of 100 years old, which we had hurriedly to find and show His Royal Highness the Prince of Wales. So you can see that the Duke of Devonshire is very thorough when he goes round the Royal. We have had a lot of records lately. We have had records of people making a century in their first Test Match in Australia. I do not know which would give the Duke the most pleasure—being elected as President of the Royal Agricultural Society or to make a century in his first Test Match, because he is equally keen, I think, on a game of cricket. But I can say this—that if you elect the Duke of Devonshire to be President for the ensuing year you will have done the very best thing you

could possibly have done for the Royal Agricultural Society of England, and the Show at Derby. Therefore I have the greatest possible pleasure in proposing that he be elected President for the ensuing 12 months. (Applause.)

LORD HASTINGS: I have the greatest possible pleasure in seconding the motion. In doing the Duke the honour of electing him as President of the Royal for a second term of office we also do great honour to ourselves, and I in common with Sir Arthur Hazlerigg, and I am sure with all of you, look forward to a most prosperous year under his Presidency. Knowing that nobody will be able to surpass or hardly equal him in his conduct of the business of the Chair, I have the greatest pleasure in seconding the motion. (Applause.)

The motion was carried by acclamation.

THE DUKE OF DEVONSHIRE: Lord Mildmay, my Lords and Gentlemen, I am most deeply grateful and sincerely appreciative of the very great honour you have done me in asking me again to take the office of President of the Royal Agricultural Society of England. When it was first suggested that my name should be put forward to the Committee of Selection I did venture to say that I doubted whether it would be wise from the Society's point of view that a departure should be made from the well-established practice that no one should take office twice in a lifetime. As Sir Arthur Hazlerigg has reminded you, with very few exceptions no one has held office as President of this great Society for more than one year. Well, gentlemen, I left it in the hands of the Committee of Selection and of the Council, and I assure you that I deeply appreciate the honour you have done me in asking me to undertake this position once more. I am exceptionally pleased that I should be President of this great organisation when its forthcoming Show is to be held in my home county of Derby. (Hear, hear.) I can assure you that we shall give the Society a most cordial and hearty welcome, and I can tell you, to use rather a slang expression, that already "the atmosphere is extremely favourable." Only this morning as I was coming up from home I saw on the station at Chesterfield someone whose name I could not recall, but whom I knew well by sight, and who said, "What is all this about this Show at Derby next year?" I said, "We are going to have a very great Show indeed." "Well," he said, "if it is anything as nearly as good as the Hope Valley Sheep Dog Trials it will be worth going to." (Laughter.) I said, "I know nothing about that, but if you come every day to the Show it will be well worth your while." He said, "We will all come from here, and in fact we are making arrangements to do so already." It is not only in the borough but throughout the county as well that that spirit prevails, and I must here give you one word of warning. Possibly when you get to Derby you will be told that what little civilisation exists on the north side of the Trent ends at Belper. Belper is only five miles from Derby, and I live twenty miles beyond that, and I can assure you that that statement is not correct. The country may be a little rough at times, but the inhabitants are very keen, very warm-hearted, and I can assure you that we are all out to make the visit of the Royal Agricultural Society to Derby not only as great a success as it has been on previous visits there, but even a greater one. (Applause.) In fact, we are out to do something more. I believe that on the occasion when I had the honour to be President of this Society when its Show was held at Newcastle there was almost a record set up both in attendance and in the financial result. We are out to try to beat that if we can, although these are not quite the days to beat records. I leave the question of making centuries in Test Matches entirely to Sir Arthur Hazlerigg or, as far as I am concerned, in any other match. I can assure you, ladies and gentlemen, that we will give the Society on the occasion of its visit next July to Derby a most cordial welcome. Already the Show is a constant topic of conversation, and the atmosphere is extremely favourable, and we are looking forward with the greatest interest to the visit. We will have a very good ground. The railway companies and everybody concerned are showing great keenness, and are most anxious to do everything in their power to make the visit a success, and if only I could feel as confident that my conduct of the management of the business of the Council would be as satisfactory as the Show I should look forward to the forthcoming year with feelings of the greatest equanimity.

I am most grateful to you for the honour you have done me. I deeply appreciate it, and I can only trust that you will have no reason to regret the choice which you have made. (Applause.)

Election of Trustees.

The PRESIDENT: It is customary for the Trustees to be elected by a show of hands. The names of the present Trustees, who are, under Bye-law 141, recommended by the Council for re-election, are printed in List "A" on the agenda paper, and I will now ask you to signify in the usual manner whether it is your pleasure that these twelve noblemen and gentlemen should be elected Trustees of the Society to hold office until the next ensuing Annual General Meeting.

The Trustees, whose names are as follows, were duly elected:

H.R.H. The Prince of Wales, K.G., York House, S.W.1.
H.R.H. The Duke of York, K.G., 145 Piccadilly, W.1.
H.R.H. The Duke of Gloucester, K.G., Buckingham Palace, S.W.1.
Charles Adeane, C.B., Babraham Hall, Cambridge.
Duke of Bedford, K.G., Woburn Abbey, Bedfordshire.
Lord Cornwallis, Linton Park, Maidstone, Kent.
Percy Crutchley, Sunninghill Lodge, Ascot, Berkshire.
Lord Daresbury, C.V.O., Walton Hall, Warrington.
Duke of Devonshire, K.G., Chatsworth, Bakewell, Derbyshire.
Lord Harlech, C.B., Brogyntyn, Oswestry, Shropshire.
Sir Arthur Hazlerigg, Bart., Noseley Hall, Leicestershire.
Lt.-Col. E. W. Stanyforth, C.B., Kirk Hammerton Hall, York.

Election of Vice-Presidents.

The PRESIDENT: I will also ask you to signify by a show of hands whether it is your pleasure that the present Vice-Presidents whose names are printed in List "B" should be re-elected to hold office until the next ensuing Annual General Meeting.

The Vice-Presidents were duly elected as below:

Rev. C. H. Brocklebank, Westwood Park, West Bergholt, Essex.
Sir Merrik R. Burrell, Bart., Floodgates, West Grinstead, Horsham.
Earl of Derby, K.G., Knowsley, Prescot, Lancashire.
Lord Desborough, K.G., Taplow Court, Maidenhead.
R. M. Greaves, Wern, Portmadoc, North Wales.
Earl of Harewood, K.G., Harewood House, Leeds.
William Harrison, Albion Iron Works, Leigh, Lancashire.
Lord Mildmay of Flete, Flete, Ermington S.O., Devon.
Duke of Portland, K.G., Welbeck Abbey, Worksop, Notts.
Earl of Powis, Powis Castle, Welshpool, Mont.
Viscount Tredegar, C.B.E., Tredegar Park, Newport, Mon.
Earl of Yarborough, Brocksby Park, Habrough, Lincolnshire.

Election of Professional Accountants and Auditors.

Mr. B. C. TIPPER: I rise to propose that Messrs. Price, Waterhouse & Co. be elected as professional accountants and auditors of the Society's accounts for the ensuing year. As I think they ought to be given a little more work, and in view of the request of the Chairman to increase our membership, I have to-day handed in a nomination for a life membership. I hope the other members all round the room will do the same to-day. You made a very happy suggestion, Sir, in your speech, namely, that the implement exhibitors were going to be consulted with regard to the Shows in future. Might I respectfully suggest that you should include in that the miscellaneous exhibitors?

Mr. F. L. GOOD: I have very great pleasure in seconding the resolution proposed by Mr. Tipper. He has said that he has nominated a life member. I have been able to nominate a member for every year, except one, that I have been a member of the Society (hear, hear)—which is since 1887. I was going to suggest to the Council that there is one way in which the deplorable state of our membership could be improved through the Journal. If you approach a man who is not a member and tell him of the benefits of the Show, the first question he puts to you is this: "Where is the Show?" and when you say at Newcastle,

if he lives at Southampton, he says it is too far away for him to go to. But if you let him have the Journal for a fortnight he will see there something which will help him very considerably as an agriculturist. I think one thing the Council might do is this. I have not the least doubt that the Secretary has by him several surplus copies of the Journal for 1931. Let him have them bound in cloth covers and circulated in certain districts on loan. He could mention in the book the advantages which a member gets—in big letters on the front page. Then I think many men who have the greatest interest in agriculture would see the advantages that they would get by belonging to this Society. I throw that out as a suggestion.

The motion was carried unanimously.

Elections to the Council.

The PRESIDENT: Under the Bye-laws the requisite measures have been taken to fill the vacancies on the Council in the representation of the Districts in Group "A." As Chairman I have now formally to report to the Annual General Meeting the names and addresses of the Ordinary Members of the Council who have been elected by the several Divisions in order that the meeting may, in the words of the Bye-law, "take cognizance of their election." This duty I formally fulfil by placing before you List "C," on pages 3 and 4 of the printed agenda paper, in which the names of the newly-elected Members are specially marked.

Northumberland: C. H. Sample, 26 St. Mary's Place, Newcastle-on-Tyne.
 Yorks (North Riding): Major Clive Behrens, Swinton Grange, Malton.
 Lancashire and Isle of Man: Windham E. Hale, Mowbreck Hall, Kirkham, and Lord Stanley, M.C., M.P., Knowsley, Prescott.
 Cheshire: J. Herbert Hall, Hill House, Mobberley, Knutsford, and R. B. Neilson, Holmwood, Sandiway.
 Derby: U. Roland Burke, Edensor House, Bakewell.
 Northampton: F. H. Thornton, Kingsthorpe Hall, Northampton.
 Norfolk: Lord Hastings, Melton Constable Park.
 Bedford: Frank Webb, Billington Estate Office, Leighton Buzzard.
 Hertford: E. E. Barclay, Brent Pelham Hall, Buntingford.
 Middlesex: The Earl of Strafford, Wrotham Park, Barnet.
 Stafford: W. W. Ryman, The Manor Farm, Wall, Lichfield.
 Worcester: Col. E. Vincent V. Wheeler, Newnham Court, Tenbury.
 Monmouth: Maj.-Gen. Lord Treowen, C.B., C.M.G., Llanarth Court, Raglan.
 Cornwall: Capt. G. H. Johnstone, Trewithen, Gramppound Road.
 Dorset: The Earl of Shaftesbury, K.P., St. Giles's House, via Salisbury.
 Hampshire and Channel Islands: Major F. H. T. Jervoise, Herriard Park, Basingstoke, and Capt. J. B. Scott, Rotherfield Park, Alton.
 Scotland: The Earl of Elgin, C.M.G., Broomhall, Dunfermline, and James Kilpatrick, Craigie Mains, Kilmarnock.

Suggestions of Members.

The PRESIDENT: Has any Governor or Member any remark to make or suggestion to offer that may be referred to the Council for their consideration?

No remarks or suggestions were made.

Vote of Thanks to President.

Lord CORNWALLIS: My Lord President, a year ago I had the honour to propose to this meeting that Lord Mildmay should be President for the ensuing year. There is one thing that most Englishmen dislike more than another—to have it said to them, "I told you so"; but if I repeated what the seconder and I said on that occasion you could not fail to agree, and agree with great pleasure and satisfaction, that all we said on that occasion was true in every particular. (Hear, hear.) The Society has never had a more painstaking, keener, or more worthy President. (Applause.) Those who were present at the General Meeting in the Showyard at Southampton will remember his speech, vibrant with sympathy for agriculture, permeated with great knowledge of the needs of the industry, full of encouragement; and his occupancy of the Chair at Bedford Square has been marked by the same great knowledge and understanding. He was, as I reminded you last year, at one time Father of the House of Commons. During the past year he has been Father of this Society, and we are richer for his great experience.

in the management of affairs. I know that every member here feels very deeply indebted to him, and we one and all hope that he may be long spared to give his great services to the welfare of this Society. (Applause.) On your behalf, I beg to move "That the Society records its very deep thanks to the President for his conduct in the Chair during the past year."

Sir WALTER GILBEY: My Lords, Ladies and Gentlemen, never have I with greater pleasure spoken to a resolution than in seconding this vote of thanks. With my friend Lord Mildmay of Flete I have had the honour of being associated on a good many societies, and I can speak from experience that everything that he has taken up in life he has been a success at—and in nothing more so than as President of the Royal Agricultural Society of England during the past year. He has distinguished himself, as he always does, in all matters which he undertook, and we are all the more grateful to him because he undertook the very onerous duty of President when he was not in very good health. He shares the view, with all of us, that the welfare of this country depends upon the prosperity of our agriculture. I have much pleasure in seconding the resolution.

The resolution was carried by acclamation.

The PRESIDENT: My Lords, Ladies and Gentlemen, Lord Cornwallis is a very old friend of mine, and both he and Sir Walter Gilbey have been much too kind to me. As to my health, it is quite true I was not very grand a little time ago, but I may tell you that a course of close connection with the Royal Agricultural Society has made me feel better than I ever felt before in my life! (Laughter and applause.) I said the day before yesterday that I only wished that my services to the Royal Agricultural Society were commensurate with the amount of enjoyment I have got out of occupying the position as your President. I can only repeat my warm thanks to everyone of you. (Applause.)

Royal Agricultural Society of England.

AWARDS OF PRIZES

AT

SOUTHAMPTON, 1932.

ABBREVIATIONS.

- I., First Prize. II., Second Prize. III., Third Prize. IV., Fourth Prize. V., Fifth Prize. R.N., Reserve Number. H.C., Highly Commended. C., Commended.

The responsibility for the accuracy of the description or pedigree and for the eligibility to compete of the animals entered in the following classes, rests solely with the Exhibitors.

Unless otherwise stated, each Prize Animal in the Classes for Horses, Cattle, Goats, Sheep, and Pigs, was "bred by Exhibitor."

HORSES.

Shires.

Class 1.—Shire Stallions, born in 1929.

- 1 I. £20 & R.N. for Champion.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for Raans Record 40796, brown, bred by W. Clark, Raans Farm, Amersham; s. Cippenham Recorder 89866, d. 114858 Gunby Autumn Briar Rose by Normanby Briar King 32672.
- 2 II. £10.—F. W. PARSONS & SONS, Speckington, Ilchester, for Leek Broadside 40752, bay, bred by Col. A. F. Nicholson, Leek; s. Stretton Broadside 89985, d. 114654 Leek Amethyst by Pendley Footprint 87728.
- 2 III. £5.—W. J. CUMBER, The Chestnuts, Theale, Berks., for Mettingham Clansman 40777, brown, bred by Lt.-Col. T. W. Daniel, D.S.O., Carlton House, Mettingham, Bungay; s. Basildon Clansman 86277, d. 111909 Hill Manor Helen by Theale Lookings 85246.

Class 2.—Shire Stallions, born in 1980.

- 9 I. £20 & Champion.—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey, for Marden Waggoner 40980, bay; s. Stretton Broadside 89985, d. 117808 Belvidere Judy by Sundridge Nulli Secundus 86952.
- 8 II. £10.—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for Bower Harboro 40859, bay; s. Moulton Harboro 89559, d. 119635 Eveline by Lincoln What's Wanted 2nd 35812.
- 6 III. £5.—W. J. CUMBER, The Chestnuts, Theale, Berks., for Lillingstone Dazzler 40967, bay, bred by H. Eady Robinson, Higham Ferrers, Northants.; s. Menestrel Boy 2nd 40119, d. 120997 Lillingstone Remembrance by Marden Premier 87685.
- 4 R.N.—J. MORRIS BELCHER, Tibberton Manor, Wellington, Shropshire, for Yaxor Clansman.
H.C.—5.

Class 3.—Shire Stallions, born in 1931.

- 16 I. £20.—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for Bower Nulli Secundus, bay; s. Statfold Nulli Secundus 40170, d. 119635 Eveline by Lincoln's What's Wanted 2nd 35812.

¹ Champion Gold Medal, and £5 to the Reserve, given by the Shire Horse Society for the best Stallion. A Prize of £2 is also given by the Shire Horse Society to the Breeder of the Champion Stallion, provided the Breeder is a Member of the Shire Horse Society, and the dam of the animal is registered in the Shire Horse Stud Book.

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- 15 II. £10.—JAMES FORSHAW & SONS, Carlton-on-Trent, Newark, for Impregnable, bay, bred by G. T. Ward & Son, Gorefield, Wisbech; s. Carlton Wild Wave 40049, d. 118083 Decoy May Queen by Roycroft Coming King 86035.
- 14 III. £5.—W. J. CUMBER, The Chestnuts, Theale, Berks., for Theale Josh, grey, bred by A. Ward, Appleby Magna, Ashby-de-la-Zouch; s. Snelston Harvester 40820, d. 97086 Bonny Grey by Charming Prince 3rd 33818.
- 19 R.N.—SIR EDWARD D. STERN, BART., Fan Court, Chertsey, for Fancourt Ajax. H.C.—17.

Class 4.—Shire Mares, with their own foals at foot.

- 22 I. £20 & Champion.—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for 123619 Bower Leading Lady, bay, born in 1929 [foal by Bower Winalot 40672]; s. Bower Black Prince 39848, d. 80820 Claypole Dray Queen by Goadby Drayman 27867.
- 20 II. £10.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for 124276 Westonavon Monks Charity, brown, born in 1926 [foal by Ashlands Clansman 40854], bred by R. Bluck, Weston-on-Avon, Stratford-on-Avon; s. Ingon Champion 39222, d. 110579 Westonavon Nun by Eaton Monk 22821.
- 25 III. £5.—A. THOMAS LOYD, O.B.E., Lockinge House, Wantage, for 118657 Nameless, bay, born in 1922 [foal by Theale Hughie 40821], bred by Isaac Driver, Medbourne, Leics.; s. Southill Rival 31838, d. Gipsy by Folville Blue Blood 29899.
- 27 R.N.—W. KNIGHT SMYTH, Broadmead, Tring, Herts., for Hay End Dark Lady. H.C.—23. C.—24, 26.

Class 5.—Shire Colt or Filly Foals, the produce of Mares entered in Class 4.¹

- 29 I. £10.—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for bay filly, born March 15; s. Bower Winalot 40672, d. 123619 Bower Leading Lady by Bower Black Prince 39848.
- 31 II. £5.—ERNEST W. HEADINGTON, Cippenham Court, Slough, for bay colt, born April 21; s. Pendley Harvester 40868, d. 118000 Cippenham Marjorie by Cippenham Draughtsman 38109.
- 33 III. £3.—W. KNIGHT SMYTH, Broadmead, Tring, Herts., for black colt, born April 27; s. Pendley Harvester 40868, d. 123881 Hay End Dark Lady by Sussex Goal-keeper 34865.
- 32 R.N.—H. C. PATCH, Dial Farm, Barrow Gurney, Bristol, for bay filly.

Class 6.—Shire Mares, born in or before 1928, not having foals at foot. A Mare 6 years old or over must have produced a live foal in 1931 or 1932.²

- 34 I. £15 & R.N. for Champion.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for 122744 Albany Queen, bay, born in 1923, bred by William Webster & Son, Newstead Farm, Stockton-on-Forest; s. Darley Wild Wave 38149, d. 118420 Albany March Countess by March King 34955.
- 38 II. £10.—E. W. WEBB, 2, Cooden Drive, Bexhill-on-Sea, for 119824 Black Bertha, black, born in 1925 [filly foal born May 23, 1931, by Kirkland Black Friar 40820], bred by D. C. & E. H. Jones, Pool Quay, Welshpool; s. Lincoln What's Wanted 2d 35812, d. 115984 Bertha Brown by Moor's Nulli Secundus 35897.
- 35 III. £5.—HARRY DIBBEN, Heather Hill, Chilworth, Romsey, Hants., for 128456 Tysoe Gem, dark brown, born in 1928, bred by T. E. Wells, Tysoe, Kington, Warwick; s. Warton Reciprocity 37020, d. 115652 Tysoe Gloaming by Ratcliffe King Cole 36846.

Class 7.—Shire Fillies, born in 1929.

- 40 I. £20.—SIR EDWARD D. STERN, BART., Fan Court, Chertsey, for 128804 Fancourt Ellen, black; s. Stretton Broadside 39985, d. 116463 Fancourt Marion by Bloater Royalty 35403.
- 41 II. £10.—E. W. WEBB, 2, Cooden Drive, Bexhill-on-Sea, for 128588 Blerton Champion's Duchess, bay, bred by T. J. Roads, Broughton, Aylesbury; s. Hedges Champion's Surprise 39509, d. 120549 Blerton Hill Duchess by Hill Manor's Champion 39728.

Class 8.—Shire Fillies, born in 1930.

- 43 I. £20.—G. R. C. FOSTER, Anstey Hall, Trumpington, Cambridge, for 124424 Bower Misty Morn, bay, bred by J. G. Runciman, 15, Downing Street, Cambridge; s. Medmenham Dictator 40118, d. 110838 Babingley Sprite by Enderby Marksman 33947.
- 45 II. £10.—A. THOMAS LOYD, O.B.E., Lockinge House, Wantage, for 124718 Lockinge Amazon, dark brown; s. Heirloom 3rd 39510, d. 108900 Kelmscott Waas by Monks Green Clanman 34770.

¹ Champion Gold Medal, and £5 to the Reserve, given by the Shire Horse Society for the best Mare or Filly. A Prize of £2 is also given by the Shire Horse Society to the Breeder of the Champion Mare or Filly, provided the Breeder is a Member of the Shire Horse Society, and the dam of the animal is registered in the Shire Horse Stud Book.

² Prizes given by the Shire Horse Society.

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- 42 III. 25.—HIS MAJESTY THE KING, Sandringham, Norfolk, for 124717 Lookinge Abess, bay, bred by A. Thomas Loyd, O.B.E., Lockinge, Wantage; s. Cippenham Friar 38110, d. 121008 Lockinge Heiress by Heirloom 3rd 39510.
44 R.N.—CHARLES FRANKLIN, 10, Bank Buildings, Bedford, for Pendley Fashion.

Class 9.—Shire Fillies, born in 1931.

- 48 I. 220.—WM. CLARK & SON, Raans Farm, Amersham, for Raans Wild Rose, dark brown, bred by Wm. Clark, Raans Farm; s. Pendley Harvester 40868, d. 114353 Gunby Autumn Briar Rose by Normanby Briar King 32672.
52 II. 210.—E. W. WEBB, 2, Cooden Drive, Bexhill-on-Sea, for Rendcombe Misty Morn, brown, bred by H. E. Farnsworth, Rendcombe, Cirencester; s. Edingale Blend 40272, d. 115211 Rendcombe Forest Maid by Ratcliffe King Cole 36846.

Class 10.—Shire Geldings by registered sires, born in or before 1929.¹

- 59 I. 220.—MANN, CROSSMAN & PAULIN, LTD., Albion Brewery, Whitechapel Road, London, E.1, for Norman, bay, born in 1924, bred by Milton Harris, Little Milton Manor, Oxford; s. Horning Counterseal 36651.
56 II. 215.—CHARLES FRANKLIN, 10, Bank Buildings, Bedford, for Pendley Warrant, bay, born in 1928, bred by Bibby Bros., Coat Green Farm, Carnforth; s. Lincoln What's Wanted 2nd 35812, d. 111806 Coat Green Encore by Rokeby Clansman 38023.
61 III. 210.—YOUNG & CO.'S BREWERY, LTD., Ram Brewery, Wandsworth, London, S.W.18, for Bower King John, brown, born in 1924, bred by G. R. C. Foster, Anstey Hall, Trumpington, Cambridge; s. Wither Pitts Gay Prince 39078, d. 112809 Medmenham Princess.
58 IV. 25.—MANN, CROSSMAN & PAULIN, LTD., for Highfield, bay, born in 1926, bred by J. B. Hall, Stillingfleet Hill Farm, Escrick, York; s. Ruler's Monk 38489.
57 V. 25.—ERNEST W. HEADINGTON, Cippenham Court, Slough, for Cippenham Angus, brown, born in 1926, bred by A. Thomas Loyd, O.B.E., Lockinge House, Wantage; s. Heirloom 3rd 39510, d. 104187 Lockinge Bramble by Haynes Dray King 38242. C.—54, 60.

Clydesdales.

Class 11.—Clydesdale Stallions, born in 1930.

- 69 I. 220 & R.N. for Champion.²—JAMES KILPATRICK, Craigie Mains, Kilmarnock, for Craigie Cameronian 21973, bay, bred by Thomas Jefferson, Townfoot, Brampton; s. Craigie Ambition 21195, d. Beryl 57620 by Ardyne Refiner 19606.
72 II. 210.—T. & M. TEMPLETON, Sandyknowe, Kelso, for Benevolence 21952, dark brown, bred by Andrew Russell, Summerston, Maryhill; s. Benefactor 20867, d. Jessie's Dream 57778 by Dunure Footprint 15208.
64 III. 25.—J. A. ARMSTRONG, The Beeches, Tarraby, Carlisle, for Virol's Heir 22055, bay; s. Scotland's Marcellus 21388, d. Virol 56981 by Ardyne Refiner 19606.
68 R.N.—DAVID ADAMS, Auchencraig, Dumbarton, for Noble Anchor. C.—66.

Class 12.—Clydesdale Stallions, born in 1931.

- 78 I. 220 & Champion.²—T. & M. TEMPLETON, Sandyknowe, Kelso, for Beneficial, brown, bred by Robert Wilson, Kirkholm, Ballantrae; s. Benefactor 20867, d. Kirkholm Margaret 58777 by Dunure Measure 20744.
74 II. 210.—ALEXANDER CLARK, Strathore House, Thornton, Fife, for Strathore Majestic, black, bred by Thomas Graham, Balone, St. Andrews; s. Woodbank Majestic 21898, d. Balone Jean by Dupplin Castle 20747.
75 III. 25.—JAMES KILPATRICK, Craigie Mains, Kilmarnock, for Craigie Dreadnought, brown, bred by John Townson, The Hall, Wackerfield; s. Craigie Eureka 21607, d. Hilton Princess by Dunure Pica 19709.
79 R.N.—WILLIAM YOUNG, West Preston, Preston Mill, Dumfries, for Preston Rent Payer.

Class 13.—Clydesdale Mares, born in or before 1929.

- 81 I. 220 & Champion.²—G. M. BECK, The Lane, Ravenstonedale, Westmorland, for Lams Lucky Girl, brown; s. Benefactor 20867, d. Craigie Beauty 56012 by Dunure Footprint 15208.
80 II. 210 & R.N. for Champion.²—DAVID ADAMS, Auchencraig, Dumbarton, for Powerful Link 58789, bay, born in 1926, bred by James Durno, Rothiebrisan, Fyvie; s. Benefactor 20867, d. Evening Tide 52150 by Rising Tide 17454.

¹ Prizes given by the Shire Horse Society.

² Champion Silver Medal given by the Clydesdale Horse Society for the best Stallion.

³ Champion Silver Medal given by the Clydesdale Horse Society for the best Mare or Filly.

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- 85 III. 25.—JOHN LAMONT, Ardyne, Toward, Argyllshire, for Ardyne Smiling Duchess, black, born in 1920, bred by Andrew Russell, Summerston, Maryhill; s. Woodbank Majestic 21393, d. Jessie's Dream 57778 by Dunure Footprint 15203.
86 R.N.—T. & M. TEMPLETON, Sandyknowe, Kelso, for June.

Class 14.—Clydesdale Fillies, born in 1930.

- 89 I. 220.—ALEXANDER CLARK, Strathore House, Thornton, Fife, for Ida, black, bred by Errington Ross, Castleheather, Inverness; s. Woodbank Majestic 21393, d. Lady Ida 52844 by Dunure Footprint 15203.
87 II. 210.—J. A. ARMSTRONG, The Beeches, Tarraby, Carlisle, for Vera, black; s. Ardyne Refiner 19606, d. Harviestoun Vedic 53307 by Dunure Footprint 15203.
91 III. 25.—CHAS. S. ELLIOT, Charter House, Kelso, for Harmonica, black; s. Benefactor 20867, d. Nisbet Harmony 53539 by Dunure Footprint 15203.
92 R.N.—JOHN G. FAIRBAIRN, Ramrig, Duns, for Benella.
G.—88.

Class 15.—Clydesdale Geldings by registered sires, born in or before 1929.¹

- 100 I. 220.—WILLIAM KERR, The Mount, Penrith, for Joe, black, born in 1929, bred by John L. Prudham, Whitefield, Carlisle; s. Ardyne Refiner 19606.
95 II. 210.—WILLIAM COLQUHOUN, Barochan Cross, Bishopston, for McMillan, bay, born in 1928, bred by Messrs. McMillan, Barrabus, Islay; s. Brudley Eminent 20514, d. Mona's Queen 53770 by Monaghan 18840.
96 III. 25.—CORPORATION OF GLASGOW CLEANSING DEPARTMENT, 20, Trongate, Glasgow, for Premier, bay, born in 1925, bred by Mr. Farquhar, Bishopmill, Elgin; s. Demonstrator 20543.
99 R.N.—JOHN R. HOLLIDAY, High Rigg, Skelton, Penrith, for Highrigg Renown.

Suffolks.

Class 16.—Suffolk Stallions, born in or before 1928.²

- 107 I. 220 & Champion.³—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill, for Red Gold of Wrattling 5932, born in 1927, bred by Sir Cuthbert Quilter, Bart., Bawdsey Manor, Woodbridge; s. Worlingham Red Gold 5506, d. Bawdsey Sappho 11350 by Earl Gray 4219.
108 II. 210.—R. EATON WHITE, Boulge Hall, Woodbridge, for Boulge Sailor 5914, born in 1927; s. Admiral of Boulge 5738, d. Boulge Queen Mary 9985 by Sudbourne Bellman 4153.
102 III. 25.—THE EARL OF IVEAGH, C.B., C.M.G., Pyrford Court, Woking, for Pyrford Paul 5793, born in 1926; s. Sudbourne Foch 4869, d. Morston Golden Girl 9945 by Morston Gold Guard 4324.
106 R.N.—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for Morston Commentator.

Class 17.—Suffolk Stallions, born in 1929.

- 112 I. 220.—DENNIS WALKER, Trowse, Norwich, for Lord Foch of Frithville 6174, bred by F. S. Fairweather, Whatfield, Ipswich; s. Sudbourne Foch 4869, d. Hadleigh Ceres 13598 by Ashmoor Cornsheaf 5286.
111 II. 210.—A. A. WALKER, Watering Farm, Yaxham Road, Dereham, for Culverden Triple Cups 6069, bred by R. Carley, Badingham, Suffolk; s. Bawdsey Bountiful 5551, d. Culverden Comet 18276 by Worlingworth Mascot 4318.
109 III. 25.—E. S. BUCK & SON, Sycamore Farm, Raveningham, Norwich, for Beatty of Raveningham 6121, bred by J. C. Orton, Chattisham, Ipswich; s. Pornham Beatty 4942, d. Chattisham Mary 12655 by Woolverstone Checkmate 4683.
110 R.N.—THE EARL OF IVEAGH, C.B., C.M.G., Pyrford Court, Woking, for Pyrford Punch.

Class 18.—Suffolk Stallions, born in 1930.

- 121 I. 220 & R.N. for Champion.¹—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for Morston Earl 6164; s. Darsham Duke 5873, d. Morston Faithful 18177 by Shotley Counterpart 4903.
118 II. 210.—R. H. & R. PAUL, Broxtead, Sutton, Woodbridge, for Broxtead Duke 6226; s. Sudbourne Foch 4869, d. Frettenham Duchess 12912 by Sudbourne Chieftain 4572.
114 III. 25.—NORMAN EVERETT, Rushmere, Ipswich, for Rushmere Hallmark 6165; s. Tattingstone Beau Esprit 4927, d. Rushmere Beryl 10912 by Morston Gold Guard 4234.
113 R.N.—FRANK J. CULLEN, Cressing Temple, Essex, for Cressing Conker.

¹ Prizes given by the Clydesdale Horse Society.

² Prizes given by the Suffolk Horse Society.

³ The "Coronation" Perpetual Silver Challenge Cup given by the Suffolk Horse Society for the best Stallion.

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Class 19.—Suffolk Stallions, born in 1931.

- 126 I. £20.—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for Morston Peer 6222; s. Darsham Duke 5878, d. Orwell Bee 12705 by Orwell Gold Sun 5163.
 125 II. £10.—W. G. HARVEY, Stewart Elm Farm, Great Stambidge, Rochford, for Walcot Punch 6255, bred by Mrs. Love, Walcot, Norwich; s. Bawdsey Barleycorn 5698, d. Blyford Flare 13579 by Blyford Seabroc 5407.

Class 20.—Suffolk Mares, with their own foals at foot.

- 130 I. £20.—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill, for Bawdsey Lustre 18687, born in 1925 [foal by Red Gold of Wrattling 5932], bred by Sir Cuthbert Quilter, Bart., Bawdsey Manor, Woodbridge; s. Framlingham Allenby 4826, d. Bawdsey Sunbeam 7044 by Bawdsey Harvester 8076.
 128 II. £10.—THE EARL OF IVEAGH, C.B., C.M.G., Pyrford Court, Woking, for Pyrford Philippa 18624, born in 1925 [foal by Pyrford Paul 5793]; s. War Boy 4672, d. Martlesham Carol 10804 by Morston Gold Guard 4234.
 129 III. £5.—LADY LODER, Leonardslee, Horsham, for Hawstead Blossom 12437, born in 1923 [foal by Blyford Seabroc 5407], bred by Capt. S. Fitzroy, Langham, Oakham; s. Sudbourne Bandolier 5153, d. Redisham Bloom 8082 by Rendlesham Goldsmith 8095.

Class 21.—Suffolk Colt Foals, the produce of Mares in Class 20.¹

- 133 I. £10.—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill, for foal born March 23; s. Red Gold of Wrattling 5932, d. Bawdsey Lustre 18687 by Framlingham Allenby 4826.

Class 22.—Suffolk Filly Foals, the produce of Mares in Class 20.¹

- 136 I. £10.—LADY LODER, Leonardslee, Horsham, for Leonardslee Seaweed, born Jan. 10; s. Blyford Seabroc 5407, d. Hawstead Blossom 12437 by Sudbourne Bandolier 5153.
 135 II. £5.—THE EARL OF IVEAGH, C.B., C.M.G., Pyrford Court, Woking, for foal born Feb. 18; s. Pyrford Paul 5793, d. Pyrford Philippa 18624 by War Boy 4672.

Class 23.—Suffolk Mares, born in or before 1928, not having foals at foot. A Mare 6 years old or over must have produced a live foal in 1931 or 1932.¹

- 140 I. £15 & Champion.—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for Bawdsey Seedling 14806, born in 1927; s. Worlingham Red Gold 5506, d. Bawdsey Hayseed 9496 by Bawdsey Hay 4188.
 141 II. £10.—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill, for Thorpe Countess 18635, born in 1925 [filly foal born Jan 10, 1931, by Worlingham Red Gold 5506], bred by H. W. Daking, White Hall, Thorpe-le-Soken, Essex; s. Tattingstone Beau Esprit 4927, d. Whitehall Countess 9942 by Morston Gold Guard 4234.
 137 III. £5.—LT.-COL. F. G. BAILEY, Lake House, Salisbury, for Ashmoor Vim 12586, born in 1928 [colt foal born May 17, 1931, by Woolverstone Buocaneer 5625], bred by A. Carlyle Smith, Sutton Hall, Woodbridge; s. Shotley Harvest Chief 4898, d. Ashmoor Vi 9866 by Sudbourne Arab 8809.
 139 R.N.—LT.-COL. F. G. BAILEY, for Kesgrave Moggy.

Class 24.—Suffolk Fillies, born in 1929.

- 140 I. £20 & R.N. for Champion.—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for Bawdsey Painted Doll 15675; s. Bawdsey Ian 5588, d. Bawdsey China Doll 2nd 7252 by Bentley War Cry 8028.
 148 II. £10.—SIR CUTHBERT QUILTER, BART., for Bawdsey Galopede 15672; s. Worlingham Red Gold 5506, d. Bawdsey Valeta 11849 by Bawdsey Hay 4188.
 147 III. £5.—ARTHUR T. PRATT, Morston Hall, Trimley, Ipswich, for Wildham Arabis 15628; s. Bawdsey Kwang-Su 5700, d. Coney Weston Arabis 12970 by Sudbourne Arabi 8287.
 145 R.N.—E. S. BUCK & SON, Sycamore Farm, Raveningham, Norwich, for Raveningham Rose Marie.
 R.C.—144.

Class 25.—Suffolk Fillies, born in 1930.

- 157 I. £20.—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for Bawdsey Secret 16100; s. Sir Harry of Morston 5676, d. Bawdsey Surety 14228 by Sudbourne Premier 4963.
 156 II. £10.—SIR CUTHBERT QUILTER, BART., for Bawdsey Louise 16097; s. Sir Harry of Morston 5676, d. Bawdsey Victoria 7962 by Bawdsey Harvester 8076.

¹ Prizes given by the Suffolk Horse Society.

² Champion Prize of £10 given by the Suffolk Horse Society for the best Mare or Filly.

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- 150 III. 25.—W. G. HARVEY, Stewart Elm Farm, Great Stambidge, Rochford, for Kentish Pride 16087, bred by Exhibitor; *s.* Martley King of Diamonds 5772, *d.* Ashmoor Faithful 14199 by Shotley Counterpart 4903.
- 159 IV. 24.—FRANK SAINSBURY, Blunts Hall, Little Wratting, Haverhill, for Wratting Sappho 16021; *s.* Worlingham Red Gold 5500, *d.* Bawdsey Sappho 11850 by Earl Gray 4219.
- 158 R.N.—FRANK SAINSBURY, for Stour Mermaid.

Class 26.—Suffolk Fillies, born in 1931.

- 165 I. 20.—LADY LODER, Leonardslee, Horsham, for Betty Blossom of Leonardslee 16199, bred by H. S. Horne, East Marden, Sussex; *s.* Blyford Seabrook 5467, *d.* Hawstead Blossom 12437 by Sudbourne Bandolier 5153.
- 164 II. 10.—ERIC R. KNIGHT, Hinderclay Hall, Diss, Norfolk, for Countess of Hinderclay 16569, bred by Mrs. Cuthbert, Buxhall, Stowmarket; *s.* Shotley Count 4900, *d.* Tacolneston Belladonna 11686 by Morston Cider Cup 4520.
- 166 III. 25.—J. A. MARSDEN POPPLE, Dances Hill, Stevenage, Herts., for Park Gwen 16219, bred by W. Kindred, Pound Farm, Great Glenham, Saxmundham; *s.* Hintlesham Reality 4813, *d.* Park Grace 12091 by Bawdsey Sir Douglas 4834.
- 163 R.N.—C. & A. W. KIDNER, Colton, Norwich, for Colton Mona.

Class 27.—Suffolk Geldings, by registered sires, born in or before 1920.¹

- 176 I. 20.—COL. SIR T. COURTENAY T. WARNER, BART., C.B., Brettenham Park, Ipswich, for Prince, born in 1927, bred by S. Warth, Hintlesham, Suffolk; *s.* Badingham Upstart 8847, *d.* Hintlesham Dorothy 8115.
- 174 II. 10.—MRS. EVELLYN RICH, Wretham Hall, Thetford, for Peter, born in 1925, bred by A. R. Crisp, Pippin Park, Lidgate, Newmarket; *s.* Sudbourne Bernard 5464, *d.* Cockfield Sunshade 7462.
- 168 III. 25.—G. & R. BLEWITT, Boxted Hall Farms, Colchester, for Boxted Maypole, born in 1928; *s.* Sudbourne Foch 4809, *d.* Westwood May Morn 10447 by Darsham Valentine 4275.
- 169 IV. 24.—RICHARD CARLEY, Badingham Red House, Woodbridge, for Big Ben, born in 1928; *s.* Woolverstone Checkmate 4683, *d.* Kingston M.D. 9074 by Gipping Doctor 4404.
- 173 R.N.—SIR CUTHBERT QUILTER, BART., Bawdsey Manor, Woodbridge, for Nelson.

Percherons.

Class 28.—Percheron Stallions, born in or before 1929.²

- 170 I. 20 & R.N. for Champion.³—H. H. TRUMAN, M.R.C.V.S., The Maze, March, Cambs., for March Viking B 478, grey, born in 1929; *s.* Hache Viking B 144, *d.* Easter E 415 by Iberes F 82972.
- 178 II. 10.—SIR HENRY H. A. HOARE, BART., Stourhead, Zeals, Wilts., for Stourhead Lagor B 421, grey, born in 1928; *s.* Lagor B 1, *d.* Torsade B 438 by Polygone F 125447.
- 177 III. 25.—LT.-COL. SIR MERRIK R. BURRELL, BART., C.B.E., Knepp Castle Estate Office, Horsham, for Knepp Xanthos B 266, grey, born in 1928; *s.* Misanthrope B 5, *d.* Potence B 80 by Japon F 84819.

Class 29.—Percheron Stallions, born in 1930.

- 180 I. 20 Champion⁴ & Champion⁴.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Grey Friar B 498, grey; *s.* Censé B 409, *d.* Ravine B 867 by Quorall B 41.
- 183 II. 10.—H. H. TRUMAN, M.R.C.V.S., The Maze, March, Cambs., for Elm Vossoir B 497, grey, bred by Co-operative Wholesale Society, Coldham Hall, Wisbech; *s.* Salammbô B 86, *d.* River Delysia B 847 by River Vossoir B 182.
- 182 III. 25.—H. C. IRVING, Shenley Lodge, Ridge Hill, Barnet, for Erpingham Defiance B 495, dark grey, bred by Robert Ives, Erpingham House, Norfolk; *s.* Salax B 157, *d.* Defiante B 885 by Pectine F 124801.

Class 30.—Percheron Stallions, born in 1931.

- 185 I. 20 & R.N. for Champion.⁴—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Blacksmith B 509, black; *s.* Broadbridge Stephen B 257, *d.* Histon Oranette B 771 by Mylord B 275.

¹ Prizes given by the Suffolk Horse Society.

² Prizes given by the British Percheron Horse Society.

³ Perpetual Silver Challenge Cup given by the British Percheron Horse Society for the best Stallion.

⁴ Perpetual Silver Challenge Cup given by the British Percheron Horse Society for the best Stallion in Classes 29 and 30 born in Great Britain.

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- 186 II. £10.—CHIVERS & SONS, LTD., for Histon Grey Knight B 514, light grey; s. Carburateur B 408, d. Petronne B 176 by Japon F 84819.
188 III. £5.—J. PIERPONT MORGAN, Wall Hall, Watford, for Aldenham Warrior B 516, dark grey; s. Histon Drayman 4th B 840, d. Greyling Welcome B 443 by Rhum B 53.

Class 31.—Percheron Mares, with their own foals at foot.

- 192 I. £20 & Champion¹.—J. PIERPONT MORGAN, Wall Hall, Watford, for Baudruche B 685, light grey, born in 1923 [foal by Histon Drayman 4th B 840], bred by L. Guion, Landes, Bellou-s-Huisne, Orne, France; s. Croisy F 180286, d. Nattiere F 114659 by Joyeux F 84874.
194 II. £10.—J. PIERPONT MORGAN, for Florence B 1024, grey, born in 1927 [foal by Foulleur F 183446], bred by Madame Yve. Burin, Marnes, France; s. Quaiman F 129648, d. Partition F 127469 by Importum F 80576.
191 III. £5.—F. J. T. MEW, Kingston Manor, Chillerton, Isle of Wight, for Areneuse B 673, grey, born in 1922 [foal by Broadbridge Stephen B 257], bred by M. Lecomte, Remalard, France; s. Ramoneur F 133946, d. Mignardise F 107831 by Celibat F 64968.

Class 32.—Percheron Colt or Filly Foals, the produce of Mares in Class 31.

- 197 I. £10.—J. PIERPONT MORGAN, Wall Hall, Watford, for grey filly, born Feb. 11; s. Histon Drayman 4th B 840, d. Baudruche B 685 by Croisy F 180286.
198 II. £5.—J. PIERPONT MORGAN, for grey filly, born March 15; s. Foulleur F 183446, d. Florence B 1024 by Quaiman F 129648.
196 III. £3.—F. J. T. MEW, Kingston Manor, Chillerton, Isle of Wight, for black filly, born April 18; s. Broadbridge Stephen B 257, d. Areneuse B 673 by Ramoneur F 133946.

Class 33.—Percheron Fillies, born in 1930.

- 199 I. £20, R.N. for Champion¹ & Champion¹.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Bright Star B 979, dark grey; s. Censé B 409, d. Sourdiere B 319 by Nigaud F 111585.
201 II. £10 & R.N. for Champion.¹—CHIVERS & SONS, LTD., for Histon Grey Lady B 987, dark grey; s. Censé B 409, d. Petronne B 176 by Japon F 84819.
203 III. £5.—J. PIERPONT MORGAN, Wall Hall, Watford, for Aldenham Doreen B 962, grey; s. Histon Drayman 4th B 840, d. Evenlode Deborah B 698 by Evenlode Valiant B 183.
200 R.N.—CHIVERS & SONS, LTD., for Histon Daydream.

Class 34.—Percheron Fillies, born in 1931.

- 205 I. £20.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Rosalind B 1046, light grey; s. Censé B 409, d. Rovigno B 256 by Mylord B 275.
210 II. £10.—J. PIERPONT MORGAN, Wall Hall, Watford, for Aldenham Doris B 1050, grey; s. Histon Drayman 4th B 840, d. Evenlode Deborah B 698 by Evenlode Valiant B 183.
204 III. £5.—CHIVERS & SONS, LTD., for Histon Defiance B 1043, grey; s. Censé B 409, d. Defiance B 854 by Ramoneur F 133946.
211 R.N.—J. PIERPONT MORGAN, for Aldenham Susan.

Class 35.—Percheron Geldings, by registered sires, born in or before 1929.³

- 216 I. £20.—J. PIERPONT MORGAN, Wall Hall, Watford, for Bellman, grey, born in 1926, bred by Lord Kimberley, Kimberley House, Wymondham; s. Hobland Belhman B 160, d. Quommede B 229 by Montrebut F 108387.
214 II. £10.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Prince, grey, born in 1928; s. Villabon B 276, d. Perthe B 178 by Japon F 84819.
215 III. £5.—R. C. IRVING, Shenley Lodge, Ridge Hill, Barnet, for Shenley Cameronian, grey, born in 1928, bred by Guy Fenwick, North Luffenham, Stamford; s. Misanthrope B 5, d. Nordica B 135 by Stonewall A 56218.
212 R.N.—LT.-COL. SIR MERRIK R. BURRELL, BART., C.B.E., Knepp Castle Estate Office, Horsham, for Knepp Baron.

¹ Perpetual Silver Challenge Cup given by the British Percheron Horse Society for the best Mare or Filly.

² Perpetual Silver Challenge Cup given by the British Percheron Horse Society for the best Filly in Classes 33 and 34 born in Great Britain.

³ Prizes given by the British Percheron Horse Society.

Hunters.

Class 36.—*Hunter Mares, with their own foals at foot.*

- 224 I. £20 & Champion.¹—MAJOR V. D. S. WILLIAMS, Greens Norton Court, Towcester, for 6905 Wait and See, chestnut, born in 1921 [foal by Vizier].
 220 II. £10 & R.N. for Champion.¹—WALTER J. FRYER, Holme Park, Sonning, Berks, for 6553 Gaylarch, bay, born in 1924 [foal by Boulevardier]; s. Gay Lally, d. 5847 Larch by Birk Gill 178.
 217 III. £5.—CAPT. C. H. BRASSEY, Bromham, Chippenham, for 6780 Bridget 8th, black, born in 1918 [foal by Logie O'Buchan], bred by J. S. O'Grady, Richardstown, New-bridge, Kildare; s. Black Prince, d. by Sir Patrick.
 218 R.N.—MRS. ELSIE FARNHAM, Finnamore, Marlow, for Quorndon Thorina.
 H.C.—228. C.—219.

Class 37.—*Hunter Mares (Novice), with their own foals at foot.*

- 228 I. £20.—SIR EDWARD D. STERN, BART., Fan Court, Chertsey, for Clewer, bay, born in 1922 [foal by Limosin].
 226 II. £10.—MRS. W. G. BUSK, Wraxall Manor, Dorchester, for 7784 Tophorn, bay, born in 1926 [foal by Austin Friars].
 225 R.N.—GEO. H. BROWN, Swaythling Farm, Southampton, for Mayday.

Class 38.—*Hunter Colt Foals, the produce of Mares in Classes 36 or 37.*

- 224 I. £15.—SIR EDWARD D. STERN, BART., Fan Court, Chertsey, for Fancourt Malcolm, brown, born May 5, 1932; s. Limosin, d. 6868 Bridget 10th by Copper Ore.
 229 II. £10.—CAPT. C. H. BRASSEY, Bromham, Chippenham, for brown, born April 14, 1932; s. Logie O'Buchan, d. 6780 Bridget 8th by Black Prince.
 230 III. £5.—MRS. W. G. BUSK, Wraxall Manor, Dorchester, for Topsail, chestnut, born May 7, 1932; s. Austin Friars, d. 7784 Tophorn by Topcover.
 231 R.N.—MRS. ELSIE FARNHAM, Finnamore, Marlow.
 H.C.—252.

Class 39.—*Hunter Filly Foals, the produce of Mares in Classes 36 and 37.*

- 238 I. £15.—SIR EDWARD D. STERN, BART., Fan Court, Chertsey, for Fancourt Fairy, chestnut, born April 21, 1932; s. Limosin, d. Clewer by Batchelor's Hope.
 236 II. £10.—WALTER J. FRYER, Holme Park, Sonning, Berks., for chestnut, born April 21, 1932; s. Boulevardier, d. 6553 Gaylarch by Gay Lally.
 239 III. £5.—MAJOR V. D. S. WILLIAMS, Greens Norton Court, Towcester, for foal, born April 25, 1932; s. The Vizier, d. 6905 Wait and See by Political.
 237 R.N.—H. S. ROBSON SCOTT, Hightown Hill, Ringwood, Hants., for Purple Silk.

Class 40.—*Hunter Fillies, born in 1929.*

- 241 I. £20 & R.N. for Champion².—JOHN EDWARD JONES, Treworgan, Ross, Herefordshire, for 7345 Cardona 2nd, brown; s. Huntly Gowk 186, d. 6889 Cardona by Cardonald.
 240 II. £10.—WALTER J. FRYER, Holme Park, Sonning, Berks., for 7252 Larlong, chestnut; s. Longboat, d. 5847 Larch by Birk Gill 178.

Class 41.—*Hunter Fillies, born in 1930.*

- 242 I. £20 & Champion.²—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for 7707 Swinton Harmony, brown; s. Aynsley, d. 8799 Swinton Honors by Dunholm.
 246 II. £10.—H. S. ROBSON SCOTT, Hightown Hill, Ringwood, Hants., for Lady Stella, brown; s. My Stars, d. 6448 Lady Butler by Baydrop.

Class 42.—*Hunter Fillies, born in 1931.*

- 248 I. £20.—JOHN EDWARD JONES, Treworgan, Ross, Herefordshire, for 7358 Lenely Lady, chestnut; s. Jilted, d. 7344 Mermaid by Brandimintine.
 252 II. £10.—SIR EDWARD D. STERN, BART., Fan Court, Chertsey, for 7847 Fancourt Irene, brown; s. Limosin, d. 6868 Bridget 10th by Copper Ore.
 250 III. £5.—H. S. ROBSON SCOTT, Hightown Hill, Ringwood, Hants., for Glad, chestnut; s. Eaglehawk, d. 6885 Gay Nun by Peter the Hermit.
 251 R.N.—H. S. ROBSON SCOTT, for Humorist.

¹ Champion Gold Medal given by the Hunters' Improvement and National Light Horse Breeding Society for the best Mare four years old and upwards, which must be either registered in the Hunter Stud Book, or the entry tendered within a month of the Award.

² Champion Gold Medal given by the Hunters' Improvement and National Light Horse Breeding Society for the best Filly not exceeding three years old, which must be either registered in the Hunter Stud Book, or the entry tendered within a month of the Award.

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Class 43.—Hunter Geldings, born in 1929.

- 259 I. £20.—THE DOWAGER LADY PENRHYN, Wicken Park, Bletchley, Bucks., for Horatio (Supp. No. 1490), black; s. Pilot, d. Nell by Chanteur.
 255 II. £10.—JOHN EDWARD JONES, Treworgan, Ross, Herefordshire, for Cupid (Supp. No. 1504), bay, bred by the late Sir Edward Currie, C.B.E., Itton Court, Chepstow; s. Furor, d. Blue Wings by William Rufus.
 254 III. £5.—J. FRAMPTON, Ranvilles Farm, Romsey, Hants., for Black Beauty, dark bay; s. Monkham, d. Black Bess.

Class 44.—Hunter Geldings, born in 1930.

- 261 I. £20.—A. V. ARKELL, Ditchford Farm, Moreton-in-Marsh, for Senegand, bay; s. Brigand, d. Sensation by Senseless.
 264 II. £10.—JOHN EDWARD JONES, Treworgan, Ross, Herefordshire, for China Cook (Supp. No. 1448), bay; s. Irawaddy, d. 6889 Cardona by Cardonald.

Class 45.—Hunter Colts or Geldings, born in 1931.

- 271 I. £20.—MISS JOAN LYSLEY, Pewsham House, Chippenham, for Wonder Bar, brown colt; s. Bardsey, d. 7457 Sweet Pepper 2nd by Brandimintine.
 272 II. £10.—MAJOR CECIL WILSON, Lyddington Manor, Swindon, for Lord Meath, bay colt; s. Sangrail, d. Gertie by Duke of Westminster.
 270 III. £5.—WALTER J. FRYER, Holme Park, Sonning, Berks., for Carlarch, chestnut colt; s. Cartoon, d. 5847 Larch by Birk Gill 178.

Polo and Riding Ponies.

Class 46.—Polo and Riding Pony Stallions, born in or before 1929, not exceeding 15 hands.

- 276 I. £20 & Champion.¹—SIR IAN WALKER, BART., Osmaston Manor, Derby, Tabarin 1682, bay, born in 1922, bred by P. de Puelle de la Nieppe, Belgium; s. Sir Toby, d. Tamise by Talion.
 274 II. £10 & R.N. for Champion.¹—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls, Romsey, Hants., for Malice 1871, chestnut, born in 1920, bred by F. J. Balfour, Argentine; s. Malandante, d. 5133 Alicia by Belsire 655.
 273 III. £5.—MISS B. G. CORY-WRIGHT, Norcott Hill, Berkhamsted, for Gold Eagle (Y.S.R. p. 36), chestnut, born in 1925, bred by Bingham Lodge Stud, Chard; s. Eaglehawk, d. Chironia by Poor Boy.

Class 47.—Polo and Riding Pony Colts, Fillies or Geldings, born in 1931.

- 281 I. £20.—MRS. J. OSCAR MUNTZ, Foxhams, Horrabridge, Devon, for Early Love (Supp. 1931), brown colt; s. Love Song 1065, d. 5224 Early Market by Yorkshire Hussar 813.
 278 II. £10 & R.N. for Champion.¹—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for Heiress (Y.S.R. p. 106), chestnut filly; s. Bridgewater, d. Miss Rich (A.M.R. p. 235).
 279 III. £5.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls, Romsey, Hants., for Malryn (Supp. 1931), bay filly; s. Malice 1871, d. Raheene (A.M.R. p. 805) by Raheen.

Class 48.—Polo and Riding Pony Colts, Fillies or Geldings, born in 1930.

- 282 I. £20, Champion² & R.N. for Champion.²—MISS B. G. CORY-WRIGHT, Norcott Hill, Berkhamsted, for Cassia 2nd (Y.S.R. p. 93), bay filly; s. Gold Eagle (Y.S.R. p. 86), d. Spice (A.M.R. p. 159).
 284 II. £10.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls, Romsey, Hants., for Malaxer (Supp. 1930), brown colt; s. Malice 1871, d. Jackdaw (A.M.R. p. 169) by Roebuck.
 286 III. £5.—LADY GUILLEMARD, Rodsall Manor, Shackleford, Godalming, for Proserpine (Supp. 1930), brown filly; s. St. Lucien's Pride 1828, d. Prosper (A.M.R. p. 119) by Posterity.
 283 R.N.—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for Scotch Lassie.

Class 49.—Polo and Riding Pony Fillies or Geldings, born in 1929.

- 292 I. £20.—COL. W. KEMMIS, C.M.G., Everton Grange, Lymington, Hants., for Sunny Jim 2nd (Supp. 1930), chestnut gelding; s. Malice 1871, d. Venus (A.M.R. p. 80).

¹ Champion Gold Medal given by the National Pony Society for the best Stallion or Colt.

² Champion Silver Medal given by the National Pony Society for the best Filly.

³ Champion Gold Medal given by the National Pony Society for the best Mare or Filly.

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- 291 II. **£10**.—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for New Moon 2nd (Supp. 1929), bay gelding; s. Wild Tint 1207, d. Blue Stone (A.M.R. p. 124), by Reform 1002.
 288 III. **£5**.—THE MISSES CALMADY-HAMLYN AND DAWSON, Pearroc Vean, Buckfast, Devon, for Patience 5th (Supp. 1931), grey filly; s. Lanchester, d. 2508 Griselda 2nd.
 289 R.N.—MISS B. G. CORY-WRIGHT, Norcott Hill, Berkhamsted, for Gold Dust.

Class 50.—Polo and Riding Pony Mares with their own foals at foot, not exceeding 15 hands.

- 294 I. **£20**.—CAPT. W. H. FRANCE-HAYHURST, Bostock Hall, Middlewich, for 6062 Rosina, chestnut, born in 1925 [foal by Silverdale Loyalty 1448]; s. Rosewood 1314, d. 5032 Juliet 2nd by Sandiway 121.
 297 II. **£10**, Champion¹ & Champion.²—MRS. J. OSCAR MUNTZ, Foxhams, Horrabridge, Devon, for 5224 Early Market, bay, born in 1920 [foal by Love Song 1065], bred by T. H. Spry, Witherdon, North Lew, Devon; s. Yorkshire Hussar 813, d. 2277 Market Girl by Bold Marca 0352.
 298 III. **£5**.—MRS. PHILIP FLEMING, Grendon Hall, Grendon Underwood, Bucks., for 5737 Syllabub, chestnut, born in 1916 [foal by Bachelor's Castle], bred by Miss S. Calmady-Hamlyn, Pearroc Vean, Buckfast; s. Barbed Fence, d. 1252 Junket by Young Belthorpe Venture.
 296 R.N. & R.N. for Champion.³—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls, Romsey, Hants., for Japan.

Riding Classes.

HUNTERS.

Class 53.—Hunter Mares or Geldings, born in 1928.

- 298 I. **£15**.—LADY MAY AINSWORTH, Ardanaiscig, Kilohrenan, Argyll, for Sir Francis (Supp. No. 1590), bay gelding, bred by D. O'Donnell, Croome, Co. Limerick; s. Francis Joseph, d. Fairish Lady by Royal Gris.
 300 II. **£10**.—RICHARD LEITCH, Manor Farm, Birdsall, Malton, for Gold Mint (late 7406 Normanby Pioneer), chestnut mare, bred by J. & V. McNeil, Normanby, Robin Hood's Bay; s. Erehwemos, d. Normanby Joybell by Bellagio.
 310 III. **£5**.—CAPT. J. B. SCOTT, Rotherfield Park, Alton, for Bonny Boy (Supp. No. 1227), bay gelding; s. Tantamount, d. 6824 Norah 7th.

Class 54.—Hunter Mares or Geldings (Novice), born in or before 1923.

- 318 I. **£15**.—GEOFF KENYON, Armscote House, Stratford-on-Avon, for James Figg, bay gelding, born in 1927.
 317 II. **£10**.—JOHN DRAGE, Chapel Brampton, Northampton, for Gallant, brown gelding, born in 1926.
 298 III. **£5**.—LADY MAY AINSWORTH, for Sir Francis. (See Class 53.)
 316 IV. **£3**.—JOHN DRAGE, for Melrose, bay gelding, born in 1925.
 322 R.N.—H. HINDLEY, Moorlands, Blacko, Nelson, Lanes., for Moor Jock.

Class 55.—Hunter Mares or Geldings, born in or before 1927, up to not more than 14 stones, suitable to carry a lady, and to be ridden by a lady side-saddle.

- 332 I. **£15**.—VERNON H. HOLT, Ravenswick, Kirbymoorside, for Fascist (Supp. No. 1372), chestnut gelding, bred by J. & V. McNeil, Normanby, Whitby; s. Flying Scot, d. Bellagio.
 331 II. **£10**.—O. A. GREENSLADE, The Lodge Farm, Chesterton, Leamington Spa, for Easter Egg (Supp. No. 1190), chestnut gelding, born in 1927; s. Political.
 299 III. **£5**.—LADY MAY AINSWORTH, Ardanaiscig, Kilohrenan, Argyll, for Cottage Pie (Supp. No. 1531), brown gelding, born in 1928, bred by William Stackpool, Rockmills, Kildollery, Co. Cork; s. Cottage, d. by Reynard.
 317 IV. **£3**.—JOHN DRAGE, for Gallant. (See Class 54.)
 333 R.N.—MRS. W. HARCOURT WEBB, Spring Grove, Bewdley, for Sodamini.
 H.O.—328.

Class 56.—Hunter Mares or Geldings, born in or before 1928, up to not more than 14 stones.

- 332 I. **£20** & R.N. for Champion.⁴—VERNON H. HOLT, for Fascist. (See Class 55.)
 317 II. **£10**.—JOHN DRAGE, for Gallant. (See Class 54.)

¹ Champion Gold Medal given by the National Pony Society for the best Mare or Filly.

² Bronze Medal given by the National Pony Society for the best Foal in Class 50 entered in the Supplement to the National Pony Stud Book.

³ Gold Challenge Cup given by gentlemen interested in Hunters for the best Mare or Gelding.

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- 308 III. #5.—JOHN E. JONES, Treworgan, Ross, Herefordshire, for Red Chieftain (late Red Chief), chestnut gelding, born in 1926, bred by the late C. C. Parr, Haugham, Louth; s. Mankato, d. La Blonde by Cyllini.
 333 IV. #3.—MRS. W. HARCOURT WEBB, Spring Grove, Bewdley, Worcs., for Sodamint, brown gelding, born in 1925.
 299 R.N.—LADY MAY AINSWORTH, for Cottage Pie.

Class 57.—Hunter Mares or Geldings, born in or before 1928, up to more than 14 stones.

- 318 I. #20 & Champion.—MRS. E. M. VAUGHAN, Blackladies, Brewwood, Stafford, for Hecland (Supp. No. 1412), chestnut gelding, born in 1925, bred by H. Holtby, Middle-
 dale, Driffeld; s. Hector.
 318 II. #10.—GEOFF KENYON, for James Figg. (See Class 54.)
 316 III. #5.—JOHN DRAGE, for Melrose. (See Class 54.)
 322 IV. #3.—H. HINDLEY, Moorlands, Blacko, Nelson, Lancs., for Moor Jack (Supp. No. 1373), brown gelding, born in 1927, bred by Edwin Foxton, Cropton, Pickering; s. Aynesley, d. by Jovial.
 301 R.N.—LADY HELEN MCCALMONT, Mount Juliet, Thomastown, Co. Kilkenny, for Handley Cross.

HACKS.

Class 58.—Hack Mares or Geldings.

- 341 I. #15 & Champion.—LT.-COL. SIR ARCHIBALD WEIGALL, K.C.M.G., Englemere, Ascot, for Radiant, bay gelding, born in 1925, bred by J. Walker, Worcester; s. Regent, d. Amnity.
 335 II. #10 & R.N. for Champion.—MAJOR V. D. S. WILLIAMS, Greens Norton Court, Towcester, for Abdulla, brown gelding, born in 1926; s. Kingsborough, d. State Express by St. Murgis.
 328 III. #5.—JAMES V. RANK, Ouborough, Godstone, Surrey, for Royal Lad, bay gelding, born in 1926.
 343 R.N.—MISS JOYCE LUCY YOUNG, Huish, Basingstoke, for Bachelor.

Class 59.—Hack Mares or Geldings, suitable to carry a lady and to be ridden by a lady side-saddle.

- 341 I. #15.—LT.-COL. SIR ARCHIBALD WEIGALL, K.C.M.G., for Radiant. (See Class 58.)
 335 II. #10.—MAJOR V. D. S. WILLIAMS, for Abdulla. (See Class 58.)
 328 III. #5.—JAMES V. RANK, for Royal Lad. (See Class 58.)
 338 R.N.—COL. J. F. N. BAVENDALE, Fraxfield Green, Petersfield, for High Peak.

CHILDREN'S PONIES.

Class 60.—Pony Mares or Geldings, not exceeding 13 hands, to be ridden by children born in or after 1922.

- 350 I. #10.—NEWBURY RIDING SCHOOL, Westmead, Newbury, for Dandy, roan gelding, born in 1926.
 343 II. #5.—MASTER JULIAN JENKINSON, Knap Hill Manor, Horsell, Woking, for Daphne, grey mare, born in 1925.
 347 III. #3.—HAROLD FIELD, St. James's, Chichester, for Bunny, bay mare, born in 1924.
 346 R.N.—CAPT. C. C. BRILL, Selden Court, Patching, Sussex, for Tiny.

Class 61.—Pony Mares or Geldings, over 13 and not exceeding 14 hands, to be ridden by children born in or after 1919.

- 365 I. #10.—MISS PEGGY PACEY, Clifton Hall, Rugby, for Lapis Lazuli, bay mare, born in 1924.
 356 II. #5.—MISS MERCY COCKBURN, Budbrook Lodge, Warwick, for Peter, chestnut gelding, born in 1925.
 355 III. #3.—THE MISSES CALMADY-HAMLYN AND DAWSON, Peartoe Vean, Buokfast, Devon, for Razzle Dazzle, brown gelding, born in 1923.
 354 R.N.—THE MISSES CALMADY-HAMLYN AND DAWSON, for Blue Ribbon.
 H.C.—361. C.—345

¹ Gold Challenge Cup given by gentlemen interested in Hunters for the best Mare or Gelding.

² Silver Challenge Cup given by a Member of the R.A.S.E. for the best Hack.

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Class 62.—Pony Mares or Geldings, over 14 and not exceeding 15 hands, to be ridden by children born in or after 1916.

- 371 I. **110.**—MISS PEGGY PACEY, Clifton Hall, Rugby, for Snap Dragon, bay gelding, born in 1924.
 370 II. **15.**—G. MADDISON, LTD., Lingfield Hunting Stables, Lingfield, for Wonder Star, chestnut mare, born in 1927.
 368 III. **13.**—THE HON. MRS. DRURY-LOWE, Nobbs Crook Farm, Windsor Forest, for Cherry Ripe, bay gelding, born in 1926.

Driving Classes.

SINGLE HARNESS.

Class 63.—Stallions, Mares or Geldings (Novice), not exceeding 14 hands.

- 378 I. **115 & Champion.**—ARTHUR R. FISH, Holme Mead, Hutton, Preston, for 26769 Barcroft Belle, bay mare, born in 1927, bred by J. E. Tweedale, Marland, Rochdale; s. Penwortham Swell 14406, d. 22616 Hollin Glow Worm by Torchfire 9472.
 377 II. **110 & E.N. for Champion.**—D. R. BLAIR, Furnivalls, Amersham, for 26891 Blairavon Venus, brown mare, born in 1927, bred by A. Gemmell, Hutton, Essex; s. Bricket Fusilier 18509, d. 25970 Braishfield Fusette by Fusee 12626.
 379 III. **15.**—ARTHUR R. FISH, for Tophet G 801, bay gelding, born in 1924, bred by Mrs. C. L. Bourne, Garsten, Watford; s. Bricket Fusilier 18509, d. 20296 Tissington Bauble by Berkeley Claudius 8372.
 388 R.N.—PAUL HOFFMANN, 4, Cardigan Mansions, Richmond Hill, Surrey, for Orford Coquette.
 H.C.—894.

Class 64.—Stallions, Mares or Geldings (Novice), over 14 hands.

- 380 I. **115.**—ARTHUR R. FISH, Holme Mead, Hutton, Preston, for Penwortham Enoch G 800, bay gelding, born in 1926, bred by Enoch Glen, Kalm Park, Bathgate; s. Ophelius 13344, d. 23635 Jollity by Mathias 6473.
 396 II. **110.**—MRS. A. C. KING, Braishfield Manor, Romsey, Hants., for 26814 Braishfield Debonair, chestnut mare, born in 1925; s. Royal Success 8995, d. 21860 Beekingham Lady Crichton.
 403 III. **15.**—WALTER MACMILLAN, Carlestoun House, Torrance of Campsie, Stirling-shire, for 26782 Dumbreck Gold Flake, chestnut mare, born in 1922, bred by Alex. Rogerson, Carlisle, Scotland; s. Radiant Mathias 13951, d. 22671 Lowmills Lady by Original 9385.
 400 R.N.—S. E. MOSS, St. Fabian's Drive, Chelmsford, for Lord Rainford.

Class 65.—Stallions, Mares or Geldings, not exceeding 13.2 hands.

- 384 I. **115.**—NIGEL C. COLMAN, M.P., 49, Grosvenor Square, London, W.1, for Nork Magnet G 879, bay gelding, bred by Dowager A. Drory de Perer; s. Braishfield Fuse 18567, d. 25106 Habrough Ideal by Fusee 12626.
 404 II. **110.**—WALTER MACMILLAN, Carlestoun House, Torrance of Campsie, Stirling-shire, for 26052 Miss Appleby, bay mare, born in 1923, bred by J. R. Brammer, Hyde Park, Doncaster; s. Southworth Swell 11219, d. 26044 Miss Appleton by Flame 10673.
 377 III. **15.**—D. R. BLAIR, for Blairavon Venus. (See Class 63.)
 389 R.N.—PAUL HOFFMANN, 4, Cardigan Mansions, Richmond Hill, Surrey, for Orford Caprice.

Class 66.—Stallions, Mares or Geldings, over 13.2 and not exceeding 14 hands.

- 383 I. **115.**—ROBERT H. MCCOLL, 9, Sherbrooke Avenue, Pollokshields, Glasgow, for 26557 Braishfield Sonnet, chestnut mare, born in 1922, bred by Mrs. A. C. King, Braishfield Manor, Romsey; s. Royal Success 8995, d. 21085 Tissington Carol by Tissington Gideon 9042.
 406 II. **110.**—F. C. MINOPRIO, Broadlands, Ascot, for Mickey Mouse G 787, bay gelding, born in 1927, bred by J. W. G. Smith, Aysgarth, Yorks.; s. Skirbeck Wireboy 14448, d. 24227 Glen Melbourne by Squire Melbourne 12167.
 381 III. **15.**—ARTHUR R. FISH, Holme Mead, Hutton, Preston, for Studholme Forester 14658, dark bay stallion, born in 1927, bred by Robert Billington, Studholme Stud, Preston; s. Holland Manitou 14014, d. 22696 Nancy Melbourne by Fireboy 7440.
 402 R.N.—S. E. MOSS, St. Fabian's Drive, Chelmsford, for Habrough Princess.
 H.C.—876.

¹ The "Glasgow" Silver Challenge Cup given by a Member of the R.A.S.E. for the best animal in the Novice Classes.

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Class 67.—Stallions, Mares or Geldings, over 14 and not exceeding 15 hands.

- 382 I. £15.—FRANK W. BUTTLE, Kirkholme, Deepdale Avenue, Scarborough, for Shalimar G 679, chestnut gelding, born in 1923, bred by Dr. Alex Bowle, Poyle Place, Colnbrook; s. Mathias A1 10751, d. 23105 Flower Princess by King's Proctor 11102.
 397 II. £10.—Mrs. A. C. KING, Braishfield Manor, Romsey, Hants., for The Raider G 628, brown gelding, born in 1922, bred by T. S. Brearley, Bramcote, Didsbury; s. Southworth Swell 11219, d. 19126 Goodmanham Lady by Polonius 4931.
 405 III. £5.—WALTER MACMILLAN, Carlestoun House, Torrance of Campsie, Stirlingshire, for 26894 All Trumps, brown mare, born in 1926, bred by John Highst, Curtecan, Ayr; s. Adbolton Pearl King 12783, d. 23699 No Trumps by Mathias 6473.
 401 R.N.—S. E. MOSS, St. Fabian's Drive, Chelmsford, for Gay Lad.

Class 68.—Stallions, Mares or Geldings, over 15 hands.

- 386 I. £15.—NIGEL C. COLMAN, M.P., 49, Grosvenor Square, London, W.1, for 26523 Modern Maid, bay mare, bred by T. M. Stephenson, Junr., Ladycroft, Huxton, Liverpool; s. Mersey Searchlight 14288, d. 19087 Flash Clara by Royal Danegelt 5785.
 408 II. £10.—F. C. MINOPRIO, Broadlands, Ascot, for Pollux G 775, bay gelding, born in 1924, bred by Lord Ashdown, Woodlawn, Co. Galway; s. Woodlawn A.D.C. 14001, d. 25704 Woodlawn Merry May by Sir Augustus 6562.
 391 III. £5.—PAUL HOFFMANN, 4, Cardigan Mansions, Richmond Hill, Surrey, for 26628 Orford Eclipse, chestnut mare, born in 1926, bred by J. W. G. Smith, Aysgarth, Yorks.; s. Angram Majesty 11967, d. 23375 Towthorpe Ailette by Polonius 4931.
 380 R.N.—ARTHUR R. FISH, for Penwortham Enoch. (See Class 64.)
 H.C.—408.

DOUBLE HARNESS.

Class 69.—Stallions, Mares or Geldings.

- 397 & 398 I. £15.—Mrs. A. C. KING, for The Raider (see Class 67), and Auroura G 649, brown gelding, born in 1920, bred by John Highst, Curtecan, Ayr; s. Fusee 12626, d. 23699 No Trumps by Mathias 6473.
 384 & 387 II. £10.—NIGEL C. COLMAN, M.P., for Nork Magnet (see Class 65), and Nork Meteor G 792, bay gelding, bred by W. Wainwright, Talke, Stoke-on-Trent; s. Braishfield Fuse 13567, d. 24036 Talke Fire Fly by Talke Fire King 9932.
 391 & 393 III. £5.—PAUL HOFFMANN, for Orford Eclipse (see Class 68), and Orford Romance, chestnut mare, born in 1925, bred by the late T. B. Colman, Norwich; s. Admiral Crichton 9573, d. 25849 Bridgham Bright Girl by King's Proctor 11102.
 388 & 389 R.N.—PAUL HOFFMANN, for Orford Coquette and Orford Caprice.
 H.C.—379 & 391.

TANDEMS.

Class 69a.—Stallions, Mares or Geldings.

- 384 & 387 I. £15.—NIGEL C. COLMAN, M.P., for Nork Magnet (see Class 65), and Nork Meteor (see Class 69).
 397 & 398 II. £10.—Mrs. A. C. KING, for The Raider (see Class 67), and Auroura (see Class 69).
 391 & 393 III. £5.—PAUL HOFFMANN, for Orford Eclipse (see Class 68), and Orford Romance (see Class 69).
 388 & 389 R.N.—PAUL HOFFMANN, for Orford Coquette and Orford Caprice.
 H.C.—399 & 402.

New Forest Ponies.

Class 70.—New Forest Pony Mares, with their own foals at foot, not exceeding 18.2 hands.

- 411 I. £5.—LEONARD BROWN, Petershold, Minstead, Lyndhurst, for 5996 Gladys 2nd, bay, born in 1925 [foal by Lyndhurst Tom], bred by T. White, Cadnam, Hants.
 412 II. £3.—Miss C. A. CECIL, Passford House, Lymington, for 3493 Cinderella 2nd, brown, born in 1918 [foal by Mallaly], bred by Miss Blackmore, Cottesmore, Burley, Ringwood; s. Earl of Pembroke 800, d. 2337 Griselda by Joe 269.
 415 III. £2.—HARRY MARCHANT, Pikes Hill, Lyndhurst, for 6187 Lyndhurst Patience, grey, born in 1921 [foal by George (Exmoor)]; s. Field Marshal 512, d. Lyndhurst Brownie.
 418 R.N.—GEORGE R. PENNY, Fleetwater Farm, Minstead, Lyndhurst, for Tots.
 H.C.—409, 414, 416.

Class 71.—New Forest Pony Fillies, born in 1930, not exceeding 18 hands.

- 421 I. £5.—Mrs. JOHN MILLS, Bisterne, Ringwood, for 6249 Bettesthorpe Jessica, bay, bred by Major J. D. Mills, M.P., Bisterne, Ringwood; s. Jester 998, d. 4940 Bettesthorpe Cautious by Burton Slowman 1081.

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- 419 II. £3.—WILLIAM BLOMFELD, The Bungalow, Paul's Lane, Sway, Lymington, for 6185 Gipsy Queen 8th, black; s. Prince Charlie 4th 1553, d. 5408 Gipsy Girl 2nd.
 420 III. £2.—GEO. G. LANDER, Purewell Farm, Christchurch, for Gala, chestnut; s. Purewell Peter, d. 5547 Purewell Ruby 8rd.
 422 R.N.—ALFRED THOMAS, Foulford Farm, Ringwood, for Green Ford Flame.

Class 72.—New Forest Pony Fillies, born in 1929, not exceeding 13.2 hands.

- 427 I. £5.—MAJOR J. D. MILLS, M.P., Bisterne, Ringwood, for 6088 Bettesthorpe Poppy brown; s. Purewell Perhaps 1357, d. 4509 Bettesthorpe Mallow by Laby Loo 765.
 428 II. £3.—H. G. BROWN, Park Farm, Minstead, Lyndhurst, for 6366 Minstead Schneider, brown; d. 1921 Minstead Peggy.
 425 III. £2.—MISS E. F. JACKSON, Brookside, Burley, Ringwood, for 5976 Pease Blossom, brown; s. Brookside Black Jack 1508, d. 5185 Brookside Titania.
 418 R.N.—MASTER J. DARLING, Alderemoor, Lyndhurst, for Burton¹ Slow Mouse.

Class 74.—New Forest Ponies, not exceeding 14 hands. To be ridden.

- 429 I. £5.—MASTER R. DARLING, Alderemoor, Lyndhurst, for 5427 Little Miss Muffet 2nd, bay mare, born in 1922, bred by E. Lander, Burton, Christchurch; s. Burton Sergt.-Major 994, d. 3447 Burton Slow Girl by Burton Spectator 688.
 434 II. £3.—MISS IVY PARRY, Farthing Cottage, Minstead, Lyndhurst, for 6101 Black Witch, black mare, born in 1927, bred by Mr. Parsons, Manor Farm, Minstead, Lyndhurst; d. Spitfire.
 430 III. £2.—FRANK DIBBEN, Westfield, Bassett, Southampton, for Rufus 2nd, chestnut gelding, born in 1927, bred by J. W. Grant, The Custards, Lyndhurst.
 438 R.N.—GEO. G. LANDER, Purewell Farm, Christchurch, for Purewell Perhaps.
 H.C.—428, 431.

CATTLE.

Unless otherwise stated the Prizes in each Class for Cattle are as follows :
 First Prize, £15; Second Prize, £10; Third Prize, £5; Fourth Prize, £4; Fifth Prize, £3.

Shorthorns.

Class 76.—Shorthorn Bulls, born in or before 1929.

- 440 I., Champion,¹ & Champion.²—A. J. MARSHALL, Bridgebank, Stranraer, for Balcairn Colonel 227865, red, born March 24, 1928, bred by F. L. Wallace, Balcairn, Oldmeldrum; s. Balcairn Welcome Duke 218130, d. 31819 Balcairn Coltsfoot by Earl of Kingston 120041.
 441 II.—A. J. MARSHALL, for Cruggleton Patrician 229491, roan, born Feb. 21, 1928; s. Balcairn Baronet 153566, d. Princess Christina by Broadhocks Diamond 124530.
 441, 449, 486 Special P.—A. J. MARSHALL, for Cruggleton Patrician, Cruggleton Prideaux and Augusta Melissa.

Class 77.—Shorthorn Bulls, born on or between January 1 and March 31, 1930.⁴

- 442 I.—J. BAIRD & CO (FALKIRK) LTD., Bantaskin, Falkirk, for Doune Mercury 243649, red and little white, born Feb. 26, bred by the Earl of Moray, Doune Lodge, Doune; s. Aldie Air Raid 227618, d. 106985 Moss Rose by Peter 218137.
 444 II.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for Pendley Philosopher 246277, red and little white, born Jan. 27; s. Millhills Roskruddan 224992, d. 88894 Cudham Broadhocks 29th by Collynie Golden Key 179455.
 445 III.—A. J. MARSHALL, Bridgebank, Stranraer, for Cruggleton Author 243275, roan, born Jan. 19; s. Bridgebank Vulcan 221490, d. 99586 Augusta Vinolia by Bridgebank Paymaster 154808.

¹ Champion Prize of £20 given by the Shorthorn Society for the best Bull. A Silver Medal was given by the Shorthorn Society to the Breeder of the Champion Bull.

² Silver Challenge Cup given by the Argentine Shorthorn Breeders' Association for the best Bull.

³ Special Prizes of £15 First Prize and £10 Second Prize given by the Shorthorn Society for the best groups of three animals bred by Exhibitor.

⁴ Prizes given by the Shorthorn Society.

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Class 78.—Shorthorn Bulls, born on or between April 1 and December 31, 1930.

- 449 I. R.N. for Champion,¹ R.N. for Champion,² & Champion.³—A. J. MARSHALL, Bridgebank, Stranraer, for Crugleton Prideaux 243852, red roan, born Aug. 14; s. Bridgebank Rosedene 218883, d. 89745 Princess Ruthina by Duke of Richmond 148551.
- 448 II.—G. M. HOPE, Basildon Home Farm, Pangbourne, Berks., for Chieftain of Stonelands 242788, dark roan, born May 6, bred by N. N. Lee, Stonelands, Arneliffe, Skipton-in-Craven; s. Collynie Red Eagle 214708, d. 64007 Stonelands Clemency 3rd by Millhills Clipper King 192168.
- 447 III.—CHIVERS & SONS, LTD., Histon, Cambridge, for Chippinghurst Prince Edwin 242805, dark roan, born Aug. 6, bred by Alfred Wheeler, Chippinghurst Manor, Cuddesdon, Oxford; s. Golden Edwin 280502, d. 114290 Chippinghurst Princess Royal 2nd by Denton Triumph 197995.

Class 79.—Shorthorn Bulls, born on or between January 1 and March 31, 1931.⁴

- 455 I.—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey, for Marden Eagle, white, born Jan. 23; s. Walshford Field Marshal 234196, d. 80903 Godinton Orphan 8th by Balcairn Eagle 168680.
- 459 II.—A. J. MARSHALL, Bridgebank, Stranraer, for Gondolier, dark roan, born Feb. 3, bred by J. & L. Durno, Uppermill, Tarves; s. Calrossie Eldorado 228722, d. 117758 Golden Bud by Collynie Silver Mint 197556.
- 458 III.—A. J. MARSHALL, for Crugleton Warrior, red, born Jan. 15; s. Crugleton Salute 229521, d. 15780 Precious Wimple by Fairlawne Red Lion 142822.
- 451 R.N.—J. BAIRD & CO. (FALKIRK), LTD., Bantaskin, Falkirk, for Coldoch Dreadnought.
- 455, 496, 504 Special II.⁴—SIR BERNARD GREENWELL, BART., for Marden Eagle, Marden Myrtle 6th and Marden Orchid 3rd.

Class 80.—Shorthorn Bulls, born on or between April 1 and June 30, 1931.

- 468 I.—BAPTON SHORTHORN CO., LTD., Bapton, Mace Farm, Cudham, Sevenoaks, for Larbert Baron, red, born April 20, bred by P. F. Jones, Dunmore Park, Larbert; s. Cluny Ian Augustus 229134, d. 87294 Larbert Clipper 11th by Saltoun Gold Dust 184885.
- 471 II.—ARTHUR GREEN, Highfield, Denton, Ilkley, Yorks., for Denton Jubilation, red, born May 5; s. Collynie Record 229210, d. 97202 Denton Keepsake by Collynie Golden Key 170455.
- 470 III.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for Pendley Reeler, roan, born May 29; s. Cluny Rosewood Rover 236117, d. 121429 Basildon Broadhooks 3rd by Millhills Rosicrucian 224902.
- 466 R.N.—J. BAIRD & CO. (FALKIRK), LTD., Bantaskin, Falkirk, for Balcairn Amir. H.C.—465.

Class 81.—Shorthorn Bulls, born on or between July 1 and December 31, 1931.⁴

- 477 I.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, for Pendley Lord Ramsden, red, born Oct. 25; s. Basildon Rosicrucian 235154, d. 89045 Basildon Lady Ramsden 2nd by Cudham Moonlight 162598.
- 480 II.—ARTHUR GREEN, Highfield, Denton, Ilkley, Yorks., for Denton Leader, roan, born Sept. 9; s. Denton Rex 229718, d. 118600 Denton Crystal by Staff Officer 226629.
- 479 III.—WILLIAM GARNER, Aldsworth, Cheltenham, for Aldsworth Provost, roan, born July 4; s. Crowthorn Guardsman 236856, d. 61591 Aldsworth Parsley by Aldsworth Suitor 168358.
- 475 R.N.—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for Swinton Nabob 2nd.

Class 82.—Shorthorn Cows, in-milk, born in or before 1928.

- 486 I. R.N. for Champion,² & Champion.⁴—A. J. MARSHALL, Bridgebank, Stranraer, for 99582 Augusta Melissa, red roan, born March 2, 1927, calved Nov. 25, 1931; s. Bridgebank Zev 205512, d. 27227 Cudham Augusta 8th by Cluny Sir Augustus 141685.

¹ Champion Prize of £20 given by the Shorthorn Society for the best Bull.

² Silver Challenge Cup given by the Argentine Shorthorn Breeders' Association for the best Bull.

³ The "Brothers Colling" Memorial Perpetual Challenge Cup presented through the Durham Agricultural Committee for the best Shorthorn.

⁴ Prizes given by the Shorthorn Society.

⁵ Special Prizes of £15 First Prize and £10 Second Prize given by the Shorthorn Society for the best groups of three animals bred by the Exhibitor.

⁶ Champion Prize of £20 given by the Shorthorn Society for the best Cow or Heifer. A Silver Medal was given by the Shorthorn Society to the Breeder of the Champion Cow or Heifer.

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- 483 II. & R.N. for Champion.¹—BAPTON SHORTHORN CO., LTD., Bapton, Mace Farm, Cudham, Sevenoaks, for 83797 Bapton Princess Royal 3rd, red, born May 10, 1928, calved Jan. 29, 1932, bred by Sir Cecil Chubb, Bart., Bapton Manor, Codford, Wilts.; s. Cluny Prince Regent 179639, d. 44438 Princess Margaret by Billington Snowstorm 154027.
- 485 III.—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for 104836 Swinton Rosebud 2nd, roan, born Aug. 12, 1928, calved Jan. 10, 1932; s. Swinton Regent 185567, d. 27399 Rosie Rosewood by Gainford Prince Royal 142527.
- 487 R.N.—WILLIAM WOOF, Clawthorpe Hall, Burton, Westmorland, for Clawthorpe Sweet Rose.

Class 83.—Shorthorn Heifers, in-milk, born in 1929.

- 488 I.—FANNY LADY LEON, Bletchley Park, Bletchley, for 120244 Bertha, red, born July 2, calved Jan. 10, 1932; s. Bletchley Clipper King 218624, d. 76073 Belinda by Balcairn Brocade 186892.
- 489 II.—VISCOUNT PORTMAN, Staple Manor, Staple Fitzpaine, Taunton, for 182329 Thurlbear Rosebud, roan, born Feb. 27, calved May 24, 1932; s. Lackham Golden King 2nd 216875, d. 89989 White Bud by Viscount 208755.

Class 84.—Shorthorn Heifers, born in 1930.

- 494 I.—WELBECK ESTATES CO., LTD., Mansfield Woodhouse, Notts., for 125563 Bapton Blythesome 2nd, roan, born April 3, bred by Sir Cecil Chubb, Bart., Bapton, Cudham, Sevenoaks; s. Roan Robin 202241, d. 50952 Blythesome 44th by Quartermaster 182925.
- 491 II.—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey, for 128785 Marden Pure Gold 4th, white, born April 20; s. Rothlebrishane Metaphor 193686, d. 18694 Notlaw Pure Gold 24th by Notlaw Luck 188276.
- 492 III.—C. M. HOPE, Basildon Home Farm, Pangbourne, Berks., for 125288 Yedingham Kate 4th, roan, born Sept. 29, bred by F. Allison, Lilac Farm, Yedingham, Malton; s. Allerston Royal Warrior 204408, d. 57663 Yedingham Kate 2nd by Calrossie Augustus Marigold 169917.

Class 85.—Shorthorn Heifers, born on or between January 1 and March 31, 1931.

- 496 I.—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey, for Marden Myrtle 6th, light roan, born Jan. 21; s. Rosehaugh Champagne 2nd 233153, d. 74181 Marden Myrtle 2nd by Balcairn Warden 168707.
- 498 II.—R. LAIDLAW SMITH, Pittodrie, Pitcaple, Aberdeenshire, for Schivas Lady Broadhooks, red, born March 29, bred by James R. Burr, Schivas House, Ellon, Aberdeenshire; s. Collynie Barnone 222200, d. 56541 Collynie Broadhooks 9th by Balcairn White Eagle 153591.

Class 86.—Shorthorn Heifers, born on or between April 1 and December 31, 1931.

- 502 I.—BAPTON SHORTHORN CO., LTD., Bapton, Mace Farm, Cudham, Sevenoaks, for Bapton Crocus 19th, roan, born Aug. 7; s. Bapton Boxing Day 228078, d. 95199 Bapton Crocus 7th by Roan Robin 202241.
- 504 II.—SIR BERNARD GREENWELL, BART., Marden Park, Woldingham, Surrey, for Marden Orchid 3rd, dark roan, born May 7; s. Rosehaugh Champagne 2nd 233153, d. 28097 Latton Orchid 11th by Cudham Archer 148254.
- 508 III.—COL. SIR FRANK BEAUCHAMP, BART., Woodborough House, Bath, for Woodborough Matilda 10th, white, born April 27; s. Haselor Rosador 230766, d. 83349 Woodborough Matilda 2nd by Windsor Ideal 146400.

Herefords.

Class 87.—Hereford Bulls, born on or before August 31, 1929.

- 506 I., Champion² & Champion.³—PERCY E. BRADSTOCK, Free Town, Tarrington, Herefordshire, for Free Town Admiral 49233, born Oct. 3, 1927; s. Crossways Saphale 44732, d. Heather by Time Test 26529.

¹ Champion Prize of £20 given by the Shorthorn Society for the best Cow or Heifer.

² Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Senior Bull.

³ Perpetual Silver Challenge Trophy given through the Hereford Herd Book Society for the best Bull.

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- 507 II.—WILLIAM LEWIS & SON, The Batch, Weobley, Herefordshire, for Lorenzo 49457, born Jan. 6, 1928, bred by D. P. Barnett, Walterstone, Llancafarn, Cardiff; s. Resolute 35537, d. Jean by Walterstone Sam 38309.
 508 III.—F. J. NEWMAN, Wickton Court, Stoke Prior, Leominster, for Wickton Oliver 51296, born Oct. 20, 1928; s. Crossways Emeraldite 44726, d. Oyster Girl 47th by Patchwork 34099.

Class 88.—Hereford Bulls, born on or between September 1, 1929, and August 31, 1930.

- 517 I., R.N. for Champion,¹ & R.N. for Champion.²—EDWARD WEBB & SONS (STOURBRIDGE), LTD., Wordsley, Stourbridge, for Wickton President 2nd 52674, born Jan. 6, 1930, bred by F. J. Newman, Lower Wickton, Leominster; s. Crossways Emeraldite 44726, d. Pink Pansy by Patchwork 34099.
 518 II.—DAVID G. WATKINS, Summer Hill, Hay, Hereford, for Nant Fawr Winston 52178, born Jan. 2, 1930, bred by D. E. Neale, Nant Fawr, Lisvane, Cardiff; s. Winston 3rd 49965, d. Carmelia by Wharton Twin 88376.
 511 III.—JOHN C. BROOKFIELD, Condover Grange, Shrewsbury, for Eyton Worthy 51755, born Oct. 27, 1929, bred by E. Craig Tanner, Eyton-on-Severn, Wroxeter; s. Eyton Tory 49208, d. Eyton Dowager 21st by Orlando of Pitsford 42697.
 514 R.N.—HERBERT N. MOORE, Priors Court, Mordiford, Hereford, for Priors Boy. H.C.—509.

Class 89.—Hereford Bulls, born on or between September 1 and November 30, 1930.³

- 520 I. & Champion.⁴—H. R. JENKINS, Westhide, Hereford, for Cameronian 53214, born Sept. 1, bred by P. E. Bradstock, Free Town, Tarrington; s. Eyton Taurus 49201, d. Free Town Rita by Crossways Saphire 44732.
 519 II.—H. R. GRIFFITHS, Little Tarrington, Herefordshire, for Tarrington Sports Model, born Oct. 18; s. Tarrington Optimist 49837, d. Ennity (Vol. 59, p. 296) by Gaines Albion 45982.
 521 III.—R. S. DE Q. QUINCEY, The Vern, Bodenham, Hereford, for Vern Improver 53997, born Oct. 23; s. Free Town Centaur 50494, d. Virginia Vern 2nd by Impressionist 46088.
 522 R.N.—H. WESTON & SONS, The Bounds, Much Marcle, Herefordshire, for Bounds Vulcan.

Class 90.—Hereford Bulls, born on or between December 1, 1930, and February 28, 1931.

- 523 I.—LORD CAWLEY, Berrington Hall, Leominster, for Shelderton Lion 53827, born Dec. 7, 1930, bred by G. Makellin, Shelderton, Aston-on-Clun; s. Gobion Prince 49295, d. Wintercote Lovely by Brampton Majestic 38647.
 525 II.—EDWARD WEBB & SONS (STOURBRIDGE), LTD., Wordsley, Stourbridge, for Astwood Silver Blaze 52736, born Dec. 4, 1930; s. Tarrington Victor 49889, d. Delysia by Subaltern 35654.
 524 III.—JOHN WALKER, Knightwick Manor, Worcester, for Harnage Beginner, born Feb. 14, 1931, bred by Mrs. V. G. Houghton, Harnage Farm, Cressage, Shropshire; s. Dinam Miguel 48854, d. Eyton Satire 18th (vol. 58, p. 509) by Lion 32709.

Class 91.—Hereford Bulls, born on or after March 1, 1931.

- 536 I. & R.N. for Champion.⁴—E. CRAIG TANNER, Eyton-on-Severn, Wroxeter, Shropshire, for Eyton Athlete, born June 5; s. Pertionlute 50943, d. Eyton Countess 22nd (Vol. 58, p. 507) by Lion 32709.
 532 II.—R. S. DE Q. QUINCEY, The Vern, Bodenham, Hereford, for Vern Impression 53995, born March 25; s. Impressionist 46088, d. Petunia Vern by Bodenham Escort 48343.
 533 III.—R. S. DE Q. QUINCEY, for Vern Imprint 53996, born April 30; s. Free Town Baronet 50491, d. Princess 5th by Bounds Improver 36079.
 529 R.N.—A. H. HARRINGTON, Mill End, Castle Froome, Ledbury, for Astwood Fisher. H.C.—520 C.—527.

¹ Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Senior Bull.

² Perpetual Silver Challenge Trophy given through the Hereford Herd Book Society for the best Bull.

³ Prizes given by the Hereford Herd Book Society.

⁴ Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Junior Bull.

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Class 92.—Hereford Cows or Heifers, in-milk, born on or before August 31, 1920.

- 537 I.—EDWARD KENWARD, Manor Farm, Preston Candover, Basingstoke, for Norma of Nutley (vol. 61, p. 380), born March 18, 1924, calved May 1, 1932; s. Commander 42117, d. Mermald by Bodenham Goodwill 35042.
- 538 II.—MRS. R. K. MORCOM, Clock House, Bromsgrave, for Cherry 38th (vol. 59, p. 537), born July 23, 1927, calved Feb. 15, 1932, bred by H. Weston & Sons, Much Marcle, Herefordshire; s. Kempley Duke 47189, d. Cherry 28th by Leen Sergeant 43837.

Class 93.—Hereford Heifers, born on or between September 1, 1929, and August 31, 1930.

- 539 I. & R.N. for Champion.—HIS MAJESTY THE KING, The Royal Farms, Windsor, for Windsor Blue Light (vol. 61, p. 183), born Feb. 18, 1930; s. Free Town Valors 48171, d. Blue Bell by Walterston Sam 38308.
- 540 II.—JOHN C. BROOKFIELD, Condover Grange, Shrewsbury, for Condover Begonia 5th (vol. 61, p. 220), born Sept. 24, 1929; s. Priory Resolute 41505, d. Condover Begonia by Orlando of Pitsford 42697.
- 541 III.—H. R. GRIFFITHS, Little Tarrington, Herefordshire, for Dewberry (vol. 61, p. 311), born Jan. 12, 1930; s. Free Town Director 49237, d. Daybreak by Aldersend Conqueror 38464.

Class 94.—Hereford Heifers, born on or between September 1 and November 30, 1930.¹

- 542 I. & Champion.—MORGAN T. JONES, Sugwas Farm, Hereford, for Sugwas Fanny (vol. 62, p. 386), born Sept. 27; s. Rose Wilfred 49757, d. Sugwas Florence 4th by British Topper 40579.
- 543 II.—JAMES MEDLICOTT, Bodenham Court, Hereford, for Bloom 2nd, born Oct. 15; s. Rose Haughty 49750, d. Godiva 7th (vol. 58, p. 364) by Eaton Dreadnought 36621.
- 544 III.—C. H. MORRIS, Weston Court, Pembridge, Herefordshire, for Weston Beauteous (vol. 62, p. 462), born Oct. 10; s. Hilarius 44969, d. Crossways Verbena 2nd by Bounteous 36107.

Class 95.—Hereford Heifers, born on or after December 1, 1930.

- 554 I.—W. H. JONES, Brook Farm, Lyonshall, Kington, for Bandana (vol. 62, p. 373), born Jan. 17, 1931; s. Gold Dust 43213, d. Bluff by Earls Court 38617.
- 553 II.—MORGAN T. JONES, Sugwas Farm, Hereford, for Sugwas Pearl (vol. 62, p. 387), born Jan. 24, 1931; s. Rocket 42869, d. Goblin Oyster Girl 4th by Lancer of Pitsford 39426.
- 548 III.—CAPT. E. H. ROUSE BOUGHTON, Downton Hall, Ludlow, for Downton Hall Matron, born Dec. 30, 1930; s. Samuel 39992, d. Kindle (vol. 60, p. 204) by Crossways Nanolite 44729.
H.C.—555.

Devons.

Class 96.—Devon Bulls, born in or before 1930.

- 557 I. & Champion.—JAMES LEWIS, Kensington, Washfield, Tiverton, for Netherexa Curly Boy 13259, born Jan. 29, 1925, bred by Alford Bros., Netherexa, Stoke Canon, Exeter; s. Nerrols Airman 11968, d. Pickwell Curly Coat 36521 by Pickwell Jacob 3rd 10250.
- 559 II. & R.N. for Champion.—FRED STANBURY, Ham Mill, Werrington, Launceston, for Werrington Royalist 14631, born Feb. 23, 1928, bred by A. M. Williams, Werrington Park, Launceston; s. Nerrols Best Man 12374, d. Cotelstone Ruth 32921 by All But 9935.
- 558 III.—GORDON C. SKINNER, Pound, Bishops Lydeard, Somerset, for Lodestar 14509, born Jan. 15, 1928, bred by the Exors. of the late C. Morris, Highfield Hall, St. Albans; s. Loader 13220, d. Northmoor Cherry 31554 by Gotton Prince 2nd 5070.

Class 97.—Devon Bulls, born in 1931.

- 567 I.—A. M. WILLIAMS, Werrington Park, Launceston, for Lee Thick 'Un 14784, born March 12, bred by Fred Allin, Lee Barton, Kilkhampton, Eude, Cornwall; s. Duke of Pound 14424, d. Lee Gay Girl 38886 by Gay Boy 12656.
- 568 II.—FRED BEADLE, Stowey Farm, Timberscombe, Taunton, for Stowey Beau 15373, born June 8; s. Tockley Nonsuch 14206, d. Beauty 4th 41361 by Town Bargain 12991.

¹ Champion Prize of £10 10s. given by the Hereford Herd Book Society for the best Cow or Heifer.

² Prizes given by the Hereford Herd Book Society.

³ Champion Prize of £10 10s. given by the Devon Castle Breeders' Society for the best Bull.

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- 561 III.—G. C. ALEXANDER, Manor Farm, Winterbourne Stoke, Salisbury, for Stoke Fortune 15872, born March 22; s. Stoke Glory 13760, d. Stoke Farewell 40955 by Longlands Rufus 13228.
568 R.N.—A. M. WILLIAMS, for Werrington Dodger.

Class 98.—Devon Cows or Heifers, in-milk, born in or before 1929.

- 569 I. & Champion.¹—CECIL BRENT, Clampit, Callington, Cornwall, for Clampit Dainty 10th 41040, born March 31, 1928, calved April 1, 1932; s. Pound Romper 12413, d. Clampit Dainty 7th 37749 by Highfield Gem 8919.
571 II. & R.N. for Champion.¹—W. J. THOMAS, Prospect House, Landkey, Barnstaple, for Clampit Snowdrop 2nd 40037, born March 12, 1927, calved Sept. 12, 1931, bred by Cecil Brent, Clampit, Callington; s. Highfield Gem 8919, d. Hendra Snowdrop 4th 35208 by Nowers Bakerloo 11145.
570 III.—NATHANIEL HEARD & SON, Home Farm, Werrington, Launceston, for Milltown Frida 40405, born May 6, 1926, calved Jan. 17, 1932; s. Wellesley Prince 12433, d. Tulip 5th 37002 by Woodlands King 11299.

Class 99.—Devon Heifers, born in 1930.

- 574 I.—H. H. BROADMEAD, Enmore Castle, Bridgwater, for Enmore New Moon 42003, born Jan. 1; s. Werrington Lord 13831, d. Avercombe Moonstone 37533 by Overton Masterpiece 11152.
576 II.—W. J. THOMAS, Prospect House, Landkey, Barnstaple, for Prospect Snowdrop 43775, born Feb. 15; s. Pound Romper 12412, d. Clampit Snowdrop 2nd 40037 by Highfield Gem 8919.
578 III.—FRED BEADLE, Stowey Farm, Timberscombe, Taunton, for Alicia 43991, born May 18, bred by Walker Thorne, Beazley Farm, Timberscombe; s. Tockley Nonsuch 14206, d. by Coombeshead Corporal 12607.
H.C.—575.

Class 100.—Devon Heifers, born in 1931.

- 578 I.—FRED BEADLE, Stowey Farm, Timberscombe, Taunton, for Stowey Mint 43996, born Jan. 8; s. Tockley Nonsuch 14206, d. Warrens Park Mint 2nd 40040 by Pound Romper 12418.
583 II.—W. J. THOMAS, Prospect House, Landkey, Barnstaple, for Upcott Hilda 12th 44715, born Feb. 9, bred by F. J. Yendell, Upcott, North Molton; s. Pound Hero 12824, d. Upcott Hilda 7th 39924 by Fiddington Viscount 10995.
585 III.—A. J. VERNEY, Overton, Bishops Tawton, Barnstaple, for Overton Lily 2nd 44768, born April 18; s. Courtier 12213, d. Overton Lily 34539 by Overton Reflector 10710.
579 R.N.—CECIL BRENT, Clampit, Callington, Cornwall, for Clampit Dainty 12th.

Sussex.

Class 101.—Sussex Bulls, born in or before 1930.

- 588 I. Champion.² Champion.³ & R.N. for Champion.⁴—L. O. JOHNSON, Peppers, Ashurst, Steyning, Sussex, for King's Barn Twin 7213, born Aug. 30, 1929; s. Petworth Toreador 16th 6802, d. Oakover Twin 20th 22642 by Oakover Lad 18th 5819.
586 II., R.N. for Champion.² & R.N. for Champion.³—EDWARD HURTLEY, Crowborough Warren, Sussex, for Crowborough Warren Marksman 6th 7200, born March 14, 1929; s. Bolebroke Marksman 14th 6827, d. Oakover Daisy 25th 22272 by Oakover Chevalier 6th 5810.
589 III.—COL. J. R. WARREN, O.B.E., M.C., The Hyde, Handcross, Haywards Heath, for Handcross Harlequin 7303, born Feb. 4, 1929; s. Ticehurst King Twin 2nd 6751, d. Lock Knelle 2nd 28244 by Bolebroke Harlequin 3rd 6247.

Class 102.—Sussex Bulls, born in 1931.

- 591 I.—L. O. JOHNSON, Peppers, Ashurst, Steyning, Sussex, for King's Barn Lad 7524, born Jan. 28; s. Petworth Toreador 16th 6802, d. Oakover Stonesdown 30th 22936 by Oakover Lad 18th 5819.
590 II.—COL. SIR G. L. COURTHOPE, BART., M.C., M.P., Whiligh, Wadhurst, Sussex, for Whiligh Marshal 7439, born Feb. 8; s. Lock Napoleon 2nd 6850, d. Whiligh Curly 10th 21140 by Normanhurst Albert 4864.

¹ Champion Prize of £10 10s. given by the Devon Cattle Breeders' Society for the best Cow or Heifer.

² Champion Silver Medal given by the Sussex Herd Book Society for the best Bull.

³ Perpetual Silver Challenge Trophy given through the Sussex Herd Book Society for the best Bull.

⁴ Perpetual Silver Challenge Cup given by the Sussex Cattle Breeders' Society of South Africa for the best Sussex.

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- 592 **III.**—**LORD LECONFIELD**, Petworth House, Sussex, for Petworth Duke 3rd 7536, born May 8; s. Petworth Duke 2nd 7230, d. Petworth Knot 8th 24123 by Lock Toreador 2nd 5924.
- 593 **R.N.**—**DR. ALFRED PALMER**, West Park, Lingfield, Surrey, for Crowborough Warren Honest 4th.

Class 103.—Sussex Cows or Heifers, in-milk, born in or before 1929.

- 597 **I.** **Champion.**¹ & **Champion.**²—**COL. J. R. WARREN**, O.B.E., M.C., The Hyde, Handcross, Haywards Heath, for Lock Knelle 2nd 23244, born March 16, 1926, calved May 16, 1932, bred by E. Ezra, Lock, Partridge Green; s. Bolebroke Harlequin 3rd 6247, d. Marlands Lady Knelle 20118 by Jacobite 5116.
- 598 **II.** & **R.N. for Champion.**²—**COL. J. R. WARREN**, O.B.E., M.C., for Lock Headless 14th 23917, born April 1, 1927, calved Jan. 21, 1932, bred by E. Ezra, Lock, Partridge Green; s. Bolebroke Harlequin 3rd 6247, d. Lock Headless 11th 21234 by Jacobite 5116.
- 595 **III.**—**BRIG.-GEN. G. HOLDSWORTH**, C.B., C.M.G., Glynde Place, Glynde, Sussex, for Caburn Gentle 3rd 24672, born Feb. 27, 1928, calved Jan. 9, 1932; s. Caburn Diploma 6370, d. Brooker Gentle 20303 by Bolebroke Peaceful Mariner 5039.

Class 104.—Sussex Heifers, born in 1930.

- 598 **I.**—**EDWARD HURTLEY**, Crowborough Warren, Sussex, for Crowborough Warren Princess 1st 25692, born Jan. 24; s. Otham Pilgrim 6521, d. Tildden Princess 24th 24332 by Prince Bill of Lyne 6322.
- 599 **II.**—**L. O. JOHNSON**, Peppers, Ashurst, Steyning, Sussex, for King's Barn Dusky Queen 25718, born Jan. 5; s. Petworth Toreador 16th 6802, d. King's Barn Dusky 24088 by King's Barn Sunbright 6213.
- 600 **III.**—**LORD LECONFIELD**, Petworth House, Sussex, for Petworth Carnation 25746, born April 14; s. King's Barn Sundridge 7005, d. Dillions Carnation 6th 20122 by Lynwick Red Rover 3811.
- 601 **R.N.**—**DR. ALFRED PALMER**, West Park, Lingfield, Surrey, for West Park Lofly Lilly.

Class 105.—Sussex Heifers, born in 1931.

- 608 **I.**—**COL. J. R. WARREN**, O.B.E., M.C., The Hyde, Handcross, Haywards Heath, for Handcross Gentle 1st 26371, born Feb. 11; s. Handcross Harlequin 7303, d. Goldstone Gentle 2nd 20744 by Goldstone Prince 4411.
- 604 **II.**—**BRIG.-GEN. G. HOLDSWORTH**, C.B., C.M.G., Glynde Place, Glynde, Sussex, for Caburn Daisy 7th 26138, born Jan. 30; s. Caburn Diploma 6370, d. Caburn Daisy 1st 22069 by Quedley Duke 3rd 5033.
- 606 **III.**—**L. O. JOHNSON**, Peppers, Ashurst, Steyning, Sussex, for King's Barn Dusky 2nd 26181, born Feb. 8; s. Petworth Toreador 16th 6802, d. King's Barn Dusky 24088 by King's Barn Sunbright 6213.
- 603 **R.N.**—**BRIG.-GEN. G. HOLDSWORTH**, C.B., C.M.G., for Caburn Comely 9th.
H.C.—607. C.—602.

Longhorns.

Class 111.—Longhorn Bulls, born in or before 1930.

- 610 **I.** & **Champion.**¹—**R. S. WALTERS**, Norfolk Lodge, Sutton Coldfield, Birmingham, for Sutton Victor 948, red, brindle and white, born March 27, 1929; s. Arden Final 891, d. Lady Violet of Kent by Admiral 632.

Class 112.—Longhorn Bulls, born in 1931.

- 614 **I.** & **R.N. for Champion.**—**R. S. WALTERS**, Norfolk Lodge, Sutton Coldfield, Birmingham, for Waddon Clark 959, red, brindle and white, born Jan. 12, bred by F. J. Mayo, Friar Waddon, Weymouth; s. Friar Bakewell 928, d. Waddon Clare by Earl Friar of Kent 815.
- 613 **II.**—**J. W. SWINNERTON-WESTON**, Over Whitacre House, Coleshill, Birmingham, for Whitacre Beau 2nd 968, brindle and white, born July 21; s. Arden Final 891, d. Whitacre Beauty 3rd by Chippinghurst Greatheart 812.

¹ Perpetual Silver Challenge Cup given by the Sussex Cattle Breeders' Society of South Africa for the best Sussex.

² Champion Silver Medal given by the Sussex Herd Book Society for the best Cow or Heifer.

³ Perpetual Silver Challenge Cup given by the Longhorn Cattle Society for the best Senior Longhorn.

⁴ Perpetual Silver Challenge Cup given by the Longhorn Cattle Society for the best Junior Longhorn.

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- 612 III.—F. J. MAYO, Friar Waddon, Upwey, Weymouth, for Waddon Dick 900, red, brindle and white, born Jan. 16; s. Friar Larkspur 942, d. Waddon Dewdrop (vol. 16, p. 12) by Arden Sunstar 893.
611 R.N.—R. R. HOLLICK, Stivichall Grange, Coventry, for Westwood Victor.

Class 113.—Longhorn Cows or Heifers, in-milk, born in or before 1929.

- 618 I. & R.N. for Champion.¹—W. E. SWINNERTON, Crickley Barrow House, Northleach, Glos., for Carnation of Chippinghurst (vol. 13, p. 23), red, brindle and white, born May 31, 1922, calved June 27, 1932, bred by H. B. Parsons, Eastwell, Ashford, Kent; s. Prince Diadem of Kent 778, d. Lady Violet of Kent by Admiral 632.
620 II.—J. W. SWINNERTON-WESTON, Over Whitacre House, Coleshill, Birmingham, for Whitacre Sunrise (vol. 16, p. 15), red, brindle and white, born July 15, 1928, calved June 27, 1932; s. Arden Final 891, d. Sunrise of Chippinghurst by Chippinghurst Cricket 811.
615 III.—LORD DOVERDALE, Westwood Park, Droitwich, for Westwood Gem (vol. 14, p. 8), red, brindle and white, born June 23, 1924, calved June 15, 1932; s. Arbury Alexander 851, d. Putley Connie by Poles Czar 685.
616 R.N.—LORD DOVERDALE, for Westwood Valencia.
H.C.—617.

Class 114.—Longhorn Heifers, born in 1930 or 1931.

- 624 I. & Champion.¹—F. J. MAYO, Friar Waddon, Upwey, Weymouth, for Friar Pet (vol. 17, p. 10), red, brindle and white, born Feb. 6, 1930; s. Friar Larkspur 942, d. Friar Pancake 2nd by Canley Omega 895.
623 II.—F. J. MAYO, for Friar Lot (vol. 17, p. 9), red, brindle and white, born May 27, 1930; s. Canwell 941, d. Friar Loop by Chester 810.
626 III.—R. S. WALTERS, Norfolk Lodge, Sutton Coldfield, Birmingham, for Sutton Viola (vol. 17, p. 14), red, brindle and white, born March 31, 1930; s. Arden Final 891, d. Lady Violet of Kent by Admiral 632.
621 R.N.—R. R. HOLLICK, Stivichall Grange, Coventry, for Finham Daphne (vol. 17, p. 5), brindle and white, born Feb. 2, 1930, bred by H. Mitcheson, Bentley, Atherstone; s. Arden Final 891, d. Arden Daphne by Whitacre Warrior 800.
H.C.—622.

Aberdeen-Angus.

Class 115.—Aberdeen-Angus Bulls, born on or before November 30, 1929.

- 634 I. Champion,² & Champion.⁴—ANDREW T. REDD, Auchterarder House, Auchterarder, Perthshire, for Jarvie Eric 67784, born Feb. 12, 1928, bred by J. Ernest Kerr, Harviestoun Castle, Dollar; s. Jidsey Eric 62088, d. Jamie Erica 74422 by Euripus of Ballindalloch 43615.
636 II. & Champion.³—J. P. ROSS-TAYLOR, Mungoswells, Duns, Berwickshire, for Mungos Gregalach 71490, born Dec. 8, 1928; s. Patron of Bywell 55449, d. Graceful 6th of Craighead 78035 by Eclipse of Ballindalloch 43266.
631 III.—W. L. HORBURY, Ettington Park, Stratford-on-Avon, for Viceroy of Willett, 59180, born March 15, 1924, bred by H. C. Venning, Taunton; s. Envoy of Candacraig 52468, d. Velvet of Bywell 61612 by Proud George 38595.
629 R.N.—COLONEL RAYMOND FENNELL, Wytham Abbey Estate, Oxford, for Black Brutus of Llantwit.
H.C.—632. C.—630, 638.

Class 116.—Aberdeen-Angus Bulls, born on or between December 1, 1929, and November 30, 1930.

- 643 I. R.N. for Champion,² & R.N. for Champion.⁴—CAPT. A. L. GOODSON, Kilham, Mindrum, Northumberland, for Beltane of Bleston 72688, born Jan. 1, 1930, bred by Marshall & Mitchell, Bleaton, Blaigowrie; s. Escort of Ballindalloch 59166, d. Bellona Maid 79231 by Euren of Ballindalloch 54730.
639 II.—VISCOUNT ALLENDALE, Bywell, Stockfield-on-Tyne, for Victor of Bywell 78727, born April 28, 1930; s. Elurio of Nisbethhill 87008, d. Viva of Apethorpe 78088 by Black Jester 54062.

¹ Perpetual Silver Challenge Cup given by the Longhorn Cattle Society for the best Senior Longhorn.

² Perpetual Silver Challenge Cup given by the Longhorn Cattle Society for the best Junior Longhorn.

³ Champion Gold Medal given by the Aberdeen-Angus Cattle Society for the best animal.

⁴ Perpetual Silver Challenge Trophy given through the Aberdeen-Angus Cattle Society for the best Bull.

⁵ Silver Medal given by the Argentine Aberdeen-Angus Association for the best animal bred by Exhibitor.

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- 646 III.—SIR PRINCE PRINCE-SMITH, BART., Southburn House, Driffield, for Barbary of Southburn 72558, born Dec. 7, 1920; s. Judas of Southburn 67880, d. Black Bara 70968 by Evendale of Bleaton 48139.
 647 R.N.—J. P. ROSS-TAYLOR, Mungoswalls, Duns, Berwickshire, for Elf of Dunira. H.C.—645. C.—640, 642.

Class 117.—Aberdeen-Angus Bulls, born on or between December 1, 1930, and November 30, 1931.

- 651 I.—BARONESS BURTON, Rangemore, Burton-on-Trent, for Kongo of Dunira 73085, born Dec. 30, 1930, bred by W. Gilchrist Macbeth, Dunira, Comrie; s. Erman of Dunira 70474, d. Kobe 69602 by Master Bummer 46946.
 652 II.—J. J. CRIDLAN, Maisemore Park, Gloucester, for Prince Evid of Maisemore 78701, born Feb. 21, 1931; s. Evideric 2nd of Maisemore 67482, d. Pride of Maisemore 19th 64341 by Idyll of Maisemore 38219.
 656 III.—ANDREW T. REID, Auchterarder House, Auchterarder, Perthshire, for Juror Eric 77996, born May 24, 1931, bred by J. Ernest Kerr, Harviestoun Castle, Dollar; s. Eros of Derculich 70488, d. Judy Erica 81416 by Enthraler of Lethen 54582.
 657 R.N.—LADY ROBINSON, Kirklington Hall, Newark, for Prince Ben of Boghead. H.C.—649. C.—652, 655.

Class 118.—Aberdeen-Angus Cows or Heifers, in-milk, born on or before November 30, 1929.

- 659 I. Champion,¹ & Champion,²—COL. J. F. N. BAXENDALE, C.B., Froxfield Green, Petersfield, for Ellen 3rd of Basildon 81884, born Jan. 29, 1926, calved Jan. 28, 1932, bred by Major J. A. Morrison, D.S.O., Basildon Park, Reading; s. Bismarck of Basildon 53999, d. Era of Harviestoun 58606 by Electric Bell 29104.
 662 II.—COL. RAYMOND FENNELL, Wytham Abbey Estate, Oxford, for Maori Belle of Doonholm 81895, born Jan. 20, 1926, calved April 19, 1932, bred by Col. Norman Kennedy, Doonholm, Ayr; s. Gentee Eric 2nd 57102, d. Bog Myrtle 74405 by Prince Benoon of Ballindalloch 61808.
 664 III.—LADY ROBINSON, Kirklington Hall, Newark, for Matchless of Amport 92174, born Dec. 24, 1928, calved Jan. 22, 1932, bred by Col. C. W. Sofer Whitburn, Amport St. Mary, Andover; s. Proud Baladan of The Burn 62756, d. Meta of Apethorpe 53824 by Exquisite of Ballindalloch 83202.
 668 R.N.—CAPT. F. B. ATKINSON, Home Farm, Gallowhill, Morpeth, for Euthalla 75th. H.C.—668. C.—660, 661.

Class 119.—Aberdeen-Angus Heifers, born on or between December 1, 1929, and November 30, 1930.

- 669 I. R.N. for Champion,¹ R.N. for Champion,² & R.N. for Champion,³—CAPT. A. L. GOODSON, Kilham, Mindrum, Northumberland, for Barmaid of Kilham 93469, born April 12, 1930; s. Embos of Bleaton 58712, d. Bridesmaid of Kilham 78825 by Prince Paramount 51357.
 671 II.—J. P. ROSS-TAYLOR, Mungoswalls, Duns, Berwickshire, for Mungos Lady Betty 94862, born Feb. 9, 1930; s. Patron of Bywell 55449, d. Belinda of Mungoswalls 77280 by Evulator of Ballindalloch 50517.
 670 III.—LESLIE K. OSMOND, Beelsby Hall, Grimsby, for Eleanor of Tomdow 93486, born Feb. 19, 1930, bred by James Gordon, Tomdow, Knockando; s. Evalus of Ballindalloch 64349, d. Elinora of Edzell 80860 by Erector of Candacraig 54599.
 666 R.N.—E. KATTE BROOKS, Coombe Farm, Thatcham, Berks., for Blackeyes of Thatcham. H.C.—668. C.—667.

Class 120.—Aberdeen-Angus Heifers, born on or between December 1, 1930, and November 30, 1931.

- 682 I.—J. P. ROSS-TAYLOR, Mungoswalls, Duns, Berwickshire, for Mungos Heather Bell 98018, born Jan. 27, 1931; s. Ermin of Mungoswalls 59183, d. Shamrock of Dallas 67877 by Prince of Perfection 40823.
 672 II.—VISCOUNT ALLENDALE, Bywell, Stocksfield-on-Tyne, for Maiona of Bywell 95617, born Dec. 2, 1930; s. Elurio of Nisbethill 67008, d. Matuba of Bywell 85932 by Erebus of Harviestoun 58780.

¹ Gold Medal given by the English Aberdeen-Angus Cattle Association for the best animal of the opposite sex to that of the animal awarded the Champion Gold Medal of the Aberdeen-Angus Cattle Society.

² Silver Medal given by the English Aberdeen-Angus Cattle Association for the best animal bred in England or Wales.

³ Silver Medal given by the Argentine Aberdeen-Angus Association for the best animal bred by Exhibitor.

- 680 III.—D. S. GOUGH, Old Hall, Pakenham, Bury St. Edmunds, for Black Dala of Ballintomb 95589, born Feb. 18, 1931, bred by D. M. Allan, Ballintomb, Granttown-on-Spey; s. Wilful Watch 65950, d. Blackbird of Delbulack 81165 by Rocket of Gallowie 58018.
- 678 IV.—CAPT. F. B. ATKINSON, Home Farm, Gallowhill, Morpeth, for Peeress of Candacraig 98458, born Jan. 4, 1931, bred by F. L. Wallace, Candacraig, Strathdon, Aberdeenshire; s. Evolver of Harviestoun 64427, d. Prella of Candacraig 88793 by Bedouin of Candacraig 58361.
- 679 V.—CAPT. A. L. GOODSON, Kilham, Mindrum, Northumberland, for Eulima 2nd of Kilham 96611, born Jan. 6, 1931; s. Embos of Bleaton 56712, d. Eulima 73rd 74893 by Kodak of Gallowie 48575.
- 675 R.N.—J. J. CRIDLAN, Maisemore Park, Gloucester, for Blackeyes 10th of Maisemore. H.C.—685. C.—683.
Cup.—J. P. ROSS-TAYLOR. R.N. for Cup.—CAPT. A. L. GOODSON.

Dairy Shorthorns.

Class 129.—*Dairy Shorthorn Bulls, born in or before 1929.*

- 690 I. & Champion.—F. J. HARDY, Hall Farm, Higham-on-the-Hill, Nuneaton, for Kenilworth Grand Prince 9th 224087, roan, born Aug. 25, 1927, bred by E. Bostock, Kenilworth; s. Streetaston Gold Prince 2nd 203202, d. 45360 Kirkbarrow Tulip by Cairngorm 47734.
- 686 II. & R.N. for Champion.—SIR MARK COLLET, BART., St. Clere, Kemsing, Sevenoaks, for Greatw Waterlooc 223446, dark roan, born Dec. 15, 1927, bred by Ralph Tustian, The Leys, Great Tew, Oxfordshire; s. Sorbrook Clarence 194218, d. 72709 Borohill Waterlooc Rosebud 2nd by Borohill Pantry Boy 187553.
- 692 III.—MAJOR G. MILLER MUNDY, Red Rice, Andover, for Redrice Winston 225914, red and little white, born Sept. 21, 1927; s. Longhills Lord Price 200551, d. Lady Winsonia 2nd by Walby Star 128699.
- 689 R.N.—CAPT. THE RT. HON. E. A. FRIZROY, M.P., Foxhill Cottage Farm, West Haddon, Rugby, for Foxhill Wild Meteor. H.C.—687, 688. C.—694, 695.

Class 130.—*Dairy Shorthorn Bulls, born in 1930.*

- 705 I.—F. MORTIMER, Golden Grove, Llanasa, Holywell, North Wales, for Dairy Lord 243461, roan, born Feb. 10, bred by T. & J. Greenup, Caldbeck, Wigton; s. Parton Rosador 225455, d. 33519 Diddington Blanche by Heggles Mac 158401.
- 701 II.—F. S. FRANCIS, Wilkinthorpe Farm, Templecombe, Somerset, for Sea Thistle 247079, roan, born Aug. 19; s. Seaplane 233426, d. Throop Wild Eyes 4th by Ithills Thistle 2nd 181861.
- 703 III.—HOBBS & DAVIS, Kelmescott, Lechlade, for Kelmescott Commander 60th 245017, red and little white, born May 23; s. Kelmescott Imperialist 104th 199917, d. 50130 Kelmescott Bertha 38rd by Kelmescott Acrobat 44th 172874.
- 699 IV.—JESSE CRUMPLER, Longlands, North Coker, Yeovil, for Foxbury Barrington King 244069, dark roan, born April 18, bred by E. Macintosh, Dorking; s. Sorbrook Dalesman 226534, d. 42523 Itchington Barrington Queen by Gay Emperor 163485.
- 709 R.N.—COMDR. F. E. TEMPLE-WEST, D.S.C., Langham, Gillingham, Dorset, for Brent Lord Wildeyes 4th. H.C.—696, 708. C.—698, 700.
- 708, 770, 797 Cup.—HOBBS & DAVIS, for Kelmescott Commander 60th, Shipton Duchess 34th and Kelmescott Melody 84th.

Class 131.—*Dairy Shorthorn Bulls, born on or between January 1 and March 31, 1931.*

- 711 I. & Special.—DEBENHAM & TORY, Anderson, Blandford, for Anderson Imperial Cran, roan, born Feb. 18; s. Anderson Imperial Minstrel 2nd 234697, d. 18714 Anderson Darlington Cran 5th by Anderson Champion Bates 186667.
- 710 II.—JOHN CROWE, Ashe Manor, Overton, Hants., for Rose's Ringleader, white, born Feb. 4; s. Barringtonian 228131, d. 106516 Sharon Rose by Claydon, Secretary 214507.

¹ Challenge Cup given through the English Aberdeen-Angus Cattle Association for the most points awarded in a combination of entries.

² Champion Prize of £10 given by the Dairy Shorthorn Association for the best Bull.

³ The "Grendon" Silver Challenge Cup given through the Dairy Shorthorn Association for the best group of one Bull and two Cows or Heifers. Two at least of the animals must have been bred by the Exhibitor.

⁴ Special Prize of £10 given by the Dairy Shorthorn Association for the best Bull in Classes 131 to 133. The following cows in the pedigree of the Bull to be registered, or provisionally accepted for registration, as qualified cows in the Dairy Shorthorn Association's Register: (1) the sire's dam and her dam, (2) the dam and her dam, and (3) the dam of the dam's sire.

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- 712 III.—CAPT. THE RT. HON. E. A. FRIZROY, M.P., Foxhill Cottage Farm, West Haddon, Rugby, for Foxhill White Star, white, born Feb. 10; s. Aldenham Lord Kirklevington 212848, d. 73526 Foxhill Wild Lena 2nd by Foxhill Caryl 171702.
 717 R.N.—W. MOLDEN, North Stoneham Farm, Eastleigh, Hants., for Fyde Referee 40th. E.C.—716, 718. C.—715, 719.
 710, 779, 780 R.N. for Cup.—JOHN CROWE, for Rose's Ringleader, Cheston Rosette and Duchess 175th.

Class 132.—Dairy Shorthorn Bulls, born on or between April 1 and June 30, 1931.²

- 730 I.—LAWRENCE HIGNETT, Hook End Farm, Hook End, Checkendon, Reading, for Checkendon Lord Barrington, red, born May 31; s. Thornby Lord Foggathorpe 16th 240714, d. 54267 Barrington Lucy by Cressida's Pride 162536.
 723 II.—SIR MARK COLLET, BART., St. Clere, Kemsing, Sevenoaks, for St. Clere Best Man, dark roan, born June 14; s. Greattew Waterloo 223446, d. 95368 St. Clere Beauty 17th by Leam Druid Master 173850.
 724 III. & R.N. for Special.³—SIR MARK COLLET, BART., for St. Clere Double Event, dark roan, born June 8; s. St. Clere Mark Time 283332, d. 122000 Pilling Sylvan Queen by Aske Wizard 153467.
 787 IV.—MAJOR G. MILLER MUNDY, Red Rice, Andover, for Redrice Chancellor 9th, red and little white, born April 17; s. Redrice Winston 225914, d. 98229 Sorbrook Bright Darling 5th by Sorbrook Foggathorpe Premier 194221.
 788 V.—DR. ALFRED PALMER, Wokefield Park, Mortimer, Berks., for Wokefield Tattler, roan, born April 28; s. Wokefield Cavalier 220242, d. 46882 Thurnham Darlington Cran 8rd by Thurnham Linksman 2nd 152578.
 727 R.N.—CAPT. THE RT. HON. E. A. FRIZROY, M.P., Foxhill Cottage Farm, West Haddon, Rugby, for Foxhill Wild Sport. E.C.—722, 725, 739. C.—720, 726, 784.

Class 133.—Dairy Shorthorn Bulls, born on or between July 1 and December 31, 1931.

- 751 I.—J. ONSLOW FANE, Steventon Manor, Hants., for Dolphinlee Waterloo King, dark roan, born July 14, bred by John Crowe, Ashe Manor, Overton, Hants.; s. Kirklevington King 8rd 238280, d. 31630 Eaton Dolphinlee Waterloo 2nd by Carleton Style 147781.
 757 II.—DR. ALFRED PALMER, Wokefield Park, Mortimer, Berks., for Wokefield Laird, roan, born July 18; s. Wokefield Lancer 241212, d. 89530 Wokefield Lemon 7th by Kelmscott Conjuror 60th 181980.
 766 III.—CECIL M. WILLS, Sherfield Court, Basingstoke, for Sherfield Lord Valentine, roan, born Aug. 9; s. Chalfield Lord Darlington 4th 228895, d. 96548 Hilderstone Lady Valentine by Hilderstone Minor 208282.
 745 IV.—SIR MARK COLLET, BART., St. Clere, Kemsing, Sevenoaks, for St. Clere Grand Duke, roan, born July 5; s. Greattew Waterloo 223446, d. 96859 Glorious 2nd by Whistlow Dove 212474.
 753 V.—E. UWINS GILLATE, Shawlands, Lingfield, Surrey, for Cromarby Jesse, red, born Sept. 17; s. Streetly Lord Barrington 2nd 240567, d. 76821 Orfold Lord Jessy 2nd by Orfold Linksman 2nd 150892.
 760 R.N.—P. & C. SEWARD, Borough Farm, Petersfield, for Boughton Victory Lad. E.C.—748, 761, 764. C.—746, 749, 758.

Class 134.—Dairy Shorthorn Cows, in-milk, born on or before March 31, 1926, having yielded a minimum of 8,000 lb. of milk during a lactation period of 315 days.⁴

- 770 I.—HOBBS & DAVIS, Kelmscott, Lechlade, for 74517 Shipton Duchess 34th, roan, born Oct. 28, 1925, calved April 22, 1932, bred by R. Hartley & Sons, Shipton-under-Wychwood, Oxon.; s. Kelmscott Comedian 19th 172879, d. 24974 Shipton Duchess 24th by Standeford Crispin 9th 152806.
 768 II.—DEBENHAM & TORY, Anderson, Blandford, for 80569 Anderson Wild Eyes 3rd, roan, born April 24, 1925, calved June 18, 1932, bred by R. N. Tory, Anderson, Blandford; s. Kelmscott Conjuror 8rd 187269, d. 32400 Yeldersley Wild Eyes 4th by Yeldersley Darlington Major 146510.

² The "Grendon" Silver Challenge Cup given through the Dairy Shorthorn Association for the best group of one Bull and two Cows or Heifers. Two at least of the animals must have been bred by the Exhibitor.

³ Prizes, except Fourth and Fifth, given by the Dairy Shorthorn Association.

⁴ Special Prize of £10 given by the Dairy Shorthorn Association for the best Bull in Classes 131 to 133. The following cows in the pedigree of the Bull to be registered, or provisionally accepted for registration, as qualified cows in the Dairy Shorthorn Association's Register: (1) the sire's dam and her dam, (2) the dam and her dam, and (3) the dam of the dam's sire.

⁵ Prizes given by the Shorthorn Society.

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767 III.—JOHN CROWE, Ashe Manor, Overton, Hants., for 58327 Strawberry 39th, red, born April 4, 1924, calved May 22, 1932, bred by M. & J. Bennett, Wallthwaite, Troutbeck, Penrith; s. Palmer Duke 183707, d. 10318 Strawberry 34th by Ennerdale Pride 142274.

Class 135.—Dairy Shorthorn Cows, in-milk, born on or between April 1, 1926, and March 31, 1927, having yielded a minimum of 8,000 lb. of milk during a lactation period of 315 days.

776 I. & R.N. for Champion.¹—J. TIMBERLAKE, Hastoe Farm, Tring, Herts., for 91918 Hastoe Wild Queen 11th, white, born April 20, 1926, calved May 4, 1932; s. Dauntless Founder 180101, d. 18924 Hastoe Wild Queen 6th by Dauntless Duke 2nd 186092.
775 II.—J. S. TAYLOR, Kirby, Whatcote, Shipston-on-Stour, for 85201 Pinkneys Lillian, roan, born April 10, 1926, calved June 3, 1932, bred by F. T. Fisher, Pinkneys Green, Maidenhead; s. Pinkneys Darlington Major 183845, d. 86290 Plaspower Lillian by Grendon Emperor 163771.

Class 136.—Dairy Shorthorn Cows, in-milk, born on or between April 1, 1927, and March 31, 1928, having yielded a minimum of 6,500 lb. of milk during a lactation period of 315 days.

781 I. & Champion.—CAPT. THE RT. HON. E. A. FITZROY, M.P., Foxhill Cottage Farm, West Haddon, Rugby, for 96698 Foxhill Ringlet 6th, light roan, born April 20, 1927, calved June 11, 1932; s. Iford Lord Lee 2nd 190752, d. 36312 Foxhill Ringlet 2nd by John Wild Eyes 149616.
779 II.—JOHN CROWE, Ashe Manor, Overton, Hants., for 94554 Cheston Rosette, roan, born Sept. 20, 1927, calved May 1, 1932, bred by W. Brown, Chesterton Priory, Peterborough; s. Longhills White Eagle 173575, d. 12827 Plaspower Oxford 2nd by Puddington Red Rudolph 182916.
789 III.—SIR EDWARD MANN, BART., Thelveton Hall, Diss, Norfolk, for 99524 Thelveton Cowslip, red, born Sept. 14, 1927, calved May 15, 1932; s. Grendon Greenhorn 2nd 190231, d. 52387 Ashe Cowslip by Kelmescott Conjuror 28th 156774.
780 IV.—JOHN CROWE, for 95618 Duchess 175th, white, born May 24, 1927, calved June 26, 1932; s. Longhills White Eagle 173575, d. 10656 Duchess 3rd by Loobagh Beau 3rd 143635.
792 R.N.—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for Eaton Winsonia.
H.C.—793.
792, 801, 802 Cup.²—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for Eaton Winsonia, Eaton Red Rose 6th and Eaton Rosedrop 3rd.
791, 808, 829 R.N. for Cup.³—J. WASHINGTON WARDLE, for Lawnhead Moss Rose 20th, Lawnhead Quickline 3rd and Lawnhead Charming Lass 9th.

Class 137.—Dairy Shorthorn Cows or Heifers, in-milk, born on or after April 1, 1928.

798 I.—SIR EDWARD MANN, BART., Thelveton Hall, Diss, Norfolk, for 110441 Thelveton Wild Maid, red and little white, born Sept. 10, 1928, calved June 2, 1932; s. Ashe Wild Prince 3rd 204565, d. 55419 Rickerscote Wild Maid 2nd by Rickerscote Leader 175459.
797 II.—HOBBS & DAVIS, Kelmescott, Lechlade, for 108746 Kelmescott Melody 34th, red, born June 8, 1928, calved June 16, 1932; s. Sorbrook Foggathorpe Premier 3rd 219269, d. 74962 Kelmescott Melody 73rd by Kelmescott Imperialist 82nd 190999.
801 III.—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for 114276 Eaton Red Rose 6th, roan, born May 13, 1928, calved May 30, 1932; s. Thornby Lord Foggathorpe 4th 208387, d. 81142 Eaton Red Rose 5th by Cherry Ben 147809.
799 R.N.—MAJOR G. MILLER MUNDY, Red Rice, Andover, for Redrice Darling 2nd.
H.C.—808.

Class 138.—Dairy Shorthorn Heifers, in-milk to first calving, born on or after April 1, 1929.³

819 I.—SIR EDWARD MANN, BART., Thelveton Hall, Diss, Norfolk, for 120900 Thelveton Etta Wildeye, dark roan, born April 30, 1929, calved April 1, 1932; s. Foxbury Wild Prince 5th 223129, d. Etta Wild Eyes 11th by Baron 129435.

¹ Champion Prize of £10, given by the Shorthorn Society for the best Cow or Heifer. A Silver Medal is given by the Shorthorn Society to the Breeder of the Champion Dairy Shorthorn Cow.

² Perpetual Silver Challenge Cup, given through the Dairy Shorthorn Association, for the best group of three Cows or Heifers, by the same sire. The sire must be living in the British Isles, and have produced living progeny in 1932.

³ Prizes, except Fourth and Fifth, given by the Dairy Shorthorn Association.

- 827 II.—J. S. TAYLOR, Kirby, Whatecote, Shipston-on-Stour, for 123691 Whatecote Rosamond, red roan, born July 6, 1929, calved May 4, 1932; s. Longhills Drusus 224599, d. 51449 Sorbrook Rosamond 2nd by Foggathorpe Premier 168806.
- 824 III.—MAJOR G. MILLER MUNDY, Red Rice, Andover, for 121519 Redrice Helen, white, born Nov. 1, 1929, calved June 16, 1932; s. Grendon Barrister 223477, d. 8669 Ing-mire Helen by Baron Bridekirk 63rd 140761.
- 822 IV.—J. PIERPONT MORGAN, Wall Hall, Watford, for 121403 Aldenham Woodnut 4th, red, born Oct. 5, 1929, calved June 11, 1932; s. Aldenham Bellman 212836, d. 40185 Aldenham Woodnut by Cantab Jocelyn's Armistice 147744.
- 823 V.—MAJOR G. MILLER MUNDY, for 121517 Redrice Darlington 2nd, roan, born Dec. 29, 1929, calved May 24, 1932; s. Grendon Barrister 223477, d. 36285 Piaspower Darlington 2nd by Grendon Emperor 168771.
- 820 R.N.—A. S. MATHIAS, Llangwarren, Letterston, Pembrokeshire, for Claydon Wild Queen 17th.
H.C.—805, 812.

Lincolnshire Red Shorthorns.

Class 139.—Lincolnshire Red Shorthorn Bulls, born in or before 1930.

- 834 I. & Champion.¹—COL. THE RT. HON. JOHN GRETTON, M.P., Stapleford Park, Melton Mowbray, for Chetwode Quibbler 25107, born Sept. 30, 1930, bred by Louis Fleischmann, Chetwode Manor, Bucks.; s. Harrington Harrington 22972, d. Chetwode Infanta by Othy Laird 17840.
- 832 II.—S. CECIL ARMITAGE, Lenton Fields, Nottingham, for Cropwell Ajax 24454, born March 19, 1929, bred by Butler Smith, Cropwell Butler, Notts.; s. Cropwell Prince 20229, d. Harlaxton Excellence by Cockerington Anderby 16282.
- 833 III.—H. GORE BROWNE, Broombriggs, Woodhouse Eaves, Loughborough, for Cocker-ington Yarn 3rd 20951, born Jan. 1, 1930, bred by J. W. Needham & Sons, South Cockerington, Louth; s. Anderby Yarn 20951, d. Algakirk Jessica 1st by Anderby Veracity 19099.
- 831 R.N.—ALLEN & ORR, LTD., Owlcotes Heath, Chesterfield, for Cockerington Normanby 12th.

Class 140.—Lincolnshire Red Shorthorn Bulls, born in 1931.

- 837 I. & R.N. for Champion.¹—E. S. TANSLEY, Bramcote Hills, Nottingham, for Seaholm Rough Coat, born May 6, bred by Harold Botterill, Tathwell Hall, Louth; s. Chetwode Minstrel 22029, d. Tathwell Cherry (vol. 30, p. 288) by Anderby Sample 16089.
- 836 II.—E. S. TANSLEY, for Seaholm Exchequer, born June 29; s. Anwick Exchequer 23424, d. Cockerington No. 148 (vol. 35, p. 846) by Petwood Normanby 19700.
- 835 III.—J. G. McDOUGALL, Chippinghurst Manor, Cuddesdon, Oxon., for Anderby Dipper 25701, born April 18, bred by J. N. Robertson and Son, Anderby Bank, Alford; s. Tathwell Crimson Coat 24105, d. Anderby Fascination by Melton Laughter 18723.

Class 141.—Lincolnshire Red Shorthorn Cows or Heifers, in-milk, born in or before 1929.²

- 838 I. & Champion.¹—II. GORE BROWN, Broombriggs, Woodhouse Eaves, Loughborough, for Broombriggs Tess (vol. 36, p. 216), born May 29, 1929, calved Feb. 13, 1932; s. Saltfleet Waterloo 22442, d. Broombriggs Rachel by Swineshead Bill 20798.
- 840 II.—J. A. MARSDEN POPPLE, Daneshill, Stevenage, for Beacon Hill Dina 2nd (vol. 34, p. 389), born March 19, 1928, calved May 25, 1932, bred by Col. C. de Paravicini, Birk-holme Manor, Corby, Lincs.; s. Anwick Victor 7th 19121, d. Beacon Hill Dina by Cockerington Anderby 16282.
- 842 III.—RUSSELL WOOD, Bendish House, Hitchin, Herts., for Bendish Red Lady 4th (vol. 33, p. 499), born March 19, 1926, calved Sept. 11, 1931; s. Burton Ruby King 2nd 14614, d. Bendish Red Lady 3rd by Bendish Champion 12261.
- 839 R.N.—JOHN EVENS & SON, Burton, Lincoln, for Broxholme Recorder.

Class 142.—Lincolnshire Red Shorthorn Cows, in-milk, born in or before 1927, showing the best milking properties.

- 844 I.—JOHN EVENS & SON, Burton, Lincoln, for Burton Jewess 5th (vol. 30, p. 355), born Oct. 17, 1928, calved May 30, 1932; s. Petwood Giant 17872, d. Burton Jewess by Priory Knight 11858.
- 845 II.—JOHN EVENS & SON, for Burton Ruby Spot 23rd (vol. 34, p. 271), born Sept. 7, 1926, calved May 25, 1932; s. Burton Ethelbert 3rd 21073, d. Burton Ruby Spot 18th by Diligence 17864.

¹ Champion Silver Challenge Cup given by the Lincolnshire Red Shorthorn Association for the best Bull.

² Prizes given by the Lincolnshire Red Shorthorn Association.

³ Champion Silver Challenge Cup given by the Lincolnshire Red Shorthorn Association for the best Cow or Heifer.

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- 843 III.—JOHN EVENS & SONS, for Burton Irene 5th (vol. 35, p. 293), born June 25, 1927, calved May 28, 1932; s. Burton Frost 21995, d. Burton Irene 2nd by Burton Cherry King 15265.
846 R.N.—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill, for Southern Charm.

Class 143.—Lincolnshire Red Shorthorn Cows or Heifers, in-milk, born in or after 1928, showing the best milking properties.¹

- 849 I.—COL. THE RT. HON. JOHN GRETTON, M.P., Stapleford Park, Melton Mowbray, for Flamville Dairymaid No. 246 (vol. 35, p. 260), born March 27, 1928, calved May 4, 1932, bred by J. O. Burchinal, Aston Flamville, Leicester; s. Flamville Acrobat 94th 22149, d. Flamville Dairymaid No. 221 by Flamville Baron 19396.
850 II.—RUSSELL WOOD, Bendish House, Hitchin, Herts., for Bendish Sunbeam 10th (vol. 35, p. 419), born May 16, 1928, calved June 10, 1932; s. Histon Dairymaid 14th 20409, d. Bendish Sunbeam 6th by Bendish Seaman 7th 15814.
848 III.—JOHN EVENS & SON, Burton, Lincoln, for Burton Vic 26th (vol. 37, p. 244), born May 11, 1929, calved March 10, 1932; s. Burton Diligence 3rd 22802, d. Burton Vic 21st by Burton Supreme 18368.
847 R.N.—JOHN EVENS & SON, for Burton Royal Starlight 15th.

Class 144.—Lincolnshire Red Shorthorn Heifers, born in 1930.

- 852 I.—H. GORE BROWNE, Broombriggs, Woodhouse Eaves, Loughborough, for Broombriggs Undine (vol. 37, p. 218), born April 16; s. Saltfleet Waterloo 22442, d. Orgarth Hill No. 79 by Hallington Rising Star 2nd 14542.
853 II.—J. A. MARSDEN POPPLE, Daneshill, Stevenage, for Castlithorpe Ada, born April 6; s. Anwick Consul 7th 21876, d. Utterby No. 79 (vol. 33, p. 357) by Anderby Tishy 17230.
851 III.—ALLEN & ORR, LTD., Owlcotes Heath, Chesterfield, for Owlcotes Teasel 3rd (vol. 36, p. 196), born March 24; s. Cockerington Normanby 12th 22832, d. Owlcotes Teasel 2nd by Anwick Brutus 2nd 20964.

Class 145.—Lincolnshire Red Shorthorn Heifers, born in 1931.

- 856 I. & R.N. for Champion.*—H. GORE BROWNE, Broombriggs, Woodhouse Eaves, Loughborough, for Broombriggs Venetia, born April 25; s. Saltfleet Waterloo 22442, d. Broombriggs Selina (vol. 35, p. 259) by Saltfleet Waterloo 22442.
855 II.—S. CECIL ARMITAGE, Lenton Fields, Nottingham, for Cropwell Violet 9th (vol. 37, p. 320), born Jan. 17, bred by Butler Smith, Cropwell Butler, Notts.; s. Cropwell Ajax 24454, d. Cropwell Violet by Harlaxton Balancer 17803.
857 III.—WILLIAM GRANT, Skinnand Manor, Navenby, Lincoln, for Skinnand Belle 16th, born April 2; s. Grimaby Grange Minister 23745, d. Skinnand Belle 12th (vol. 34, p. 287) by Anderby Workman 20027.

South Devons.

Class 146.—South Devon Bulls, born in or before 1930.

- 863 I.—JOHN WAKEHAM, Rowden, Newton Ferrers, Devon, for Cadet 11366, born July 25, 1925, bred by the late L. A. Oldiere, West Prawle, Salcombe, Devon; s. Lavender's Boy 3rd 9833, d. Vera 3rd 21866 by Rowden Strawberry Boy 6988A.
864 II.—GEORGE WILLS, Rydon, Newton Abbot, for Charleston No. 55 12416, born Oct. 9, 1929, bred by J. L. Cornish, Charleston, Kingsbridge; s. Flete Forester 6th 11443, d. Dora 38109 by Edmeston General 12th 10666.
861 III.—J. T. DENNIS, Winsor Farm, Yealmpton, for Charleston No. 56 12417, born Oct. 16, 1929, bred by J. L. Cornish, Charleston, Kingsbridge; s. Flete Forester 6th 11443, d. Bertha 26627.
862 R.N.—MISS JERVOISE SMITH, Sandwell, Harberton, Totnes, for Flete Perfection 7th.

Class 147.—South Devon Bulls, born in 1931.

- 865 I.—R. W. CHAFFE, Worswell Barton, Revelstoke, Newton Ferrers, for Worswell Primordial 18182, born March 25; s. Flete Prince 10235, d. Worswell Golden Primrose 3rd 32149 by Tinnell Boy 10021.
867 II.—WARWICK R. HARVEY, Crebar, Yealmpton, for Yealm Francis 9th, born May 1; s. Sir Francis 12343, d. Sunshine 3rd 34668 by Gerston Peer 11473.
866 III.—R. W. CHAFFE, for XL Captain 18184, born March 7, bred by P. Cocks, Fardel Manor, Ivybridge; s. Rowden Cadet 2nd 12119, d. Fidget 44th 24685 by Charles 6464.
868 R.N.—JOHN WAKEHAM, Rowden, Newton Ferrers, for Rowden Cadet 28th.

Class 148.—South Devon Cows or Heifers, in-milk, born in or before 1929.

- 869 I.—HENRY CHAFFE, Harestone, Brixton, Devon, for Harestone Gladys 16th 29703, born Dec. 26, 1924, calved Jan. 22, 1932; s. Keaton Prince 3rd 9854, d. Worswell Gladys 11th 21096 by Widland Champion 6874.

¹ Prizes given by the Lincolnshire Red Shorthorn Association.

* Champion Silver Challenge Cup given by the Lincolnshire Red Shorthorn Association for the best Cow or Heifer.

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- 870 II.—R. W. CHAFFE, Worswell Barton, Revelstoke, Newton Ferrers, for Worswell Gladys 17th 32148, born Jan. 7, 1926, calved May 18, 1932; s. Tinnell Boy 10021, d. Worswell Gladys 12th 22757 by Widland Champion 6874.
- 877 III.—MISS JERVOISE SMITH, Sandwell, Harberton, Totnes, for Sandwell Sundew 32784, born June 17, 1926, calved May 11, 1932; s. Pamphlete Smashaway 10400, d. Moss 25228 by Hacombe King 8506.
- 876 IV.—MISS JERVOISE SMITH, for Dittisham Nina 2nd 31766, born June 9, 1925, calved June 18, 1932, bred by Capt. Starkey, Dittisham, Dartmouth; s. Iwerne Dairy Prince 4th 10737, d. Dittisham Nina 20246 by Widland Forester 2nd 8871.
- 874 R.N.—DARTINGTON HALL, LTD., Barton Farm, Dartington Barton, Totnes, for Myrtle.

Class 149.—South Devon Heifers, born in 1930 or 1931.¹

- 881 I.—MRS. ELLEN FORD, Wrenwell Farm, Denbury, Newton Abbot, for Wrenwell Rosaleen C. 236, born Jan. 2, 1931; s. Rowden Cadet 10th 12382, d. Arosa B. 10 by Compton Cowboy 11081.
- 879 II.—HENRY CHAFFE, Harestone, Brixton, Devon, for Harestone Gladys 21st 35235, born Jan. 3, 1930; s. Merryman 1181, d. Harestone Gladys 16th 29703 by Keaton Prince 8rd 9854.
- 880 III.—J. T. DENNIS, Winsor Farm, Yealmpton, for Flete Edna 35663, born April 10, 1930, bred by Lord Mildmay of Flete, Flete, Ermington; s. Englebourne No. 20 12225, d. Flete Sylvia 33454 by Widland No. 1 10077.

Red Polls.

Class 150.—Red Poll Bulls, born in or before 1929.

- 882 I. & Champion.²—MAJOR J. S. AGNEW, Rougham, Bury St. Edmunds, for Lichfield Conductor 14536, born April 4, 1927, bred by E. & B. Moore, Somerleyton, Lowestoft; s. Morston Conductive 18150, d. 27072 Lichfield Lucy by Lichfield Roger 10759.
- 890 II. & R.N. for Champion.²—S. E. RADFORD, Algar House, Fersfield, Dias, for Mickleover Red Fox 15049, born Aug. 3, 1928, bred by A. Preston Jones, Mickleover, Derby; s. Glevering Heron 13669, d. 30679 Ashmoor Vixen by Aspoll Eros 6th 11875.
- 888 III.—LT.-COL. R. C. BATT, C.B.E., Gresham Hall, Norwich, for Gresham Magnet 14904, born April 5, 1928; s. Bredfield Darius 2nd 12942, d. 34018 Gresham Mayfly by Basildon Royal 11882.
- 887 IV.—CAPT. R. S. HALL, New Hall, Tendring, Clacton-on-Sea, for Bromley Champagne 14832, born April 14, 1928, bred by the late Percy Crossman, Great Bromley Hall, Essex; s. Framlingham Champagne 13738, d. 30247 Neeton Desdemona by Marham Armistice 11410.
- 886 R.N.—S. W. COPLEY, Deacon's Hill, Elstree, Herts., for Framlingham Gondolier. C.—885.

Class 151.—Red Poll Bulls, born in 1930.

- 895 I.—MRS. R. M. FOOT, White Hill, Berkhamsted, Herts., for White Hill Reggie 16291, born Feb. 4; s. Basildon Regulator 14028, d. 38662 White Hill Fair Lady by Meddler Full Cry 18188.
- 893 II.—LT.-COL. R. C. BATT, C.B.E., Gresham Hall, Norwich, for Gresham Caractacus 15710, born June 28; s. Basildon Royal 11882, d. 27708 Gresham Carolina by Davyson 347th 10976.
- 898 III.—OWEN H. SMITH, Langham, Oakham, for Banksborough Æsop 15876, born Nov. 24; s. Hatton Fabulist 11985, d. 25479 Bredfield Nelly by Major General 10894.
- 896 R.N.—JOHN G. GRAY, Coombe Abbey, Coventry, for Abbeycombe Fabian.

Class 152.—Red Poll Bulls, born on or between January 1 and May 31, 1931.

- 906 I.—STUART PAUL, Kirton Lodge, Ipswich, for Kirton May King 16148, born Feb. 26; s. Leylands Bright Boy 14979, d. 34286 Kirton Maid by Easton Scuttle Away 11966.
- 899 II.—LT.-COL. R. C. BATT, C.B.E., Gresham Hall, Norwich, for Gresham Rudolph 16099, born Jan. 8; s. Basildon Royal 11882, d. 25671 Helmingham Rustle Girl by Helmingham Rupert 10876.
- 908 III.—STANLEY A. WALLER, Oulton Hall, Lowestoft, for Oulton Gauntlet 16234, born Feb. 4; s. Gaddesby Gauntlet 12620, d. 29024 Lichfield Louise by Easton Peach Bitters 11129.
- 904 IV.—LT.-COL. C. HEYWORTH-SAVAGE, Bradwell Grove, Burford, Oxford, for Bradwell Dairyman 16003, born April 22; s. Upton Marquis 14708, d. 24401 Neeton Dolores by Shrewsbury 10489. H.O.—900.

¹ Prizes given by the South Devon Herd Book Society.

² Champion Prize of £5 given by the Red Poll Cattle Society for the best Bull.

c *Awards of Live Stock Prizes at Southampton, 1932.*

Class 153.—Red Poll Bulls, born on or between June 1 and December 31, 1931.¹

- 915 I.—LT.-COL. C. HEYWORTH-SAVAGE, Bradwell Grove, Burford, Oxford, for Bradwell Professor 16006, born June 9; s. Upton Marquis 14708, d. 40923 Bradwell Peperino by Bradwell Dragon 14039.
- 914 II.—N. A. HEYWOOD, Glevering Park, Wickham Market, Woodbridge, for Henham Dapper 16117, born June 21, bred by the Earl of Stradbroke, Henham, Beccles; s. Basildon Councillor 14777, d. 41490 Henham Dahlia by Kirton Sam 19462.
- 920 III.—CAPT. ALAN RICHARDSON, Seven Springs Farm, Cheltenham, for Seven Springs Lucifer 2nd, born Oct. 6; s. Meddler Full Cry 18188, d. 42209 Seven Springs Lucinda by Bredfield Rambler 12236.
- 916 IV.—J. N. KENDALL, Brimpsfield Park, Gloucestershire, for Brimpsfield Bonaparte 16025, born June 7; s. Brimpsfield Barrister 14456, d. 37857 Ladyswood Maude by Langham Prime 12710.
- 917 E.N.—BRIG.-GEN. A. H. O. LLOYD, C.B., C.M.G., Leaton Knolls, Shrewsbury, for Leaton Prince 2nd. C.—910.

Class 154.—Red Poll Cows, in-milk, born in or before 1926.

- 934 I. & Champion.²—LADY LODER, Leonardslee, Horsham, for 37885 Lichfield Red Rose 3rd, born Nov. 29, 1926, calved May 27, 1932, bred by E. & B. Moore, Somerleyton, Lowestoft; s. Gaddesby Gauntlett 12620, d. 80152 Lichfield Red Rose 2nd by Churwell Redskin 11586.
- 924 II. & R.N. for Champion.²—LORD CRANWORTH, Grundisburgh, Suffolk, for 37530 Grundisburgh Wanderer, born July 4, 1926, calved April 30, 1932; s. Gresham Mainstay 18030, d. 32532 Grundisburgh Tourist by Framlingham Fanatic 12612.
- 921 III.—HIS MAJESTY THE KING, Sandringham, Norfolk, for 32960 Necton Daffodil, born Sept. 18, 1923, calved Jan. 7, 1932, bred by R. Harvey Mason, Necton Hall, Swaffham; s. Marham Armistice 11410, d. 26410 Necton Dolores by Shrewsbury 10489.
- 926 IV.—CAPT. SIR H. E. DE TRAFFORD, BART., Newsells Park, Barkway, Royston, Herts., for 81320 Kirton Fatsy, born June 23, 1923, calved June 3, 1932, bred by the late W. F. Paul, Kirton, Ipswich; s. Lichfield Victor 11406, d. 27947 Kirton Prize by Red Cross 11051.
- 932 E.N.—MRS. M. L. GRIFFITH, Little Hallingsbury Park, Bishops Stortford, for Morston Countess 3rd. H.C.—929, 931.

Class 155.—Red Poll Cows or Heifers, in-milk, born in 1927, 1928, or 1929.¹

- 935 I.—HIS MAJESTY THE KING, Sandringham, Norfolk, for 42157 Royal Lent Lily, born Aug. 14, 1923, calved March 20, 1932; s. Royal Rambler 14295, d. 32960 Necton Daffodil by Marham Armistice 11410.
- 939 II.—LORD CRANWORTH, Grundisburgh, Suffolk, for 41432 Grundisburgh Lucky Duck, born Aug. 16, 1928, calved May 25, 1932; s. Longford Drake 14229, d. 35746 Grundisburgh Good Luck by Framlingham Fanatic 12612.
- 936 III.—LT.-COL. SIR MERRIK R. BURRELL, BART., C.B.E., Knepp Castle, Horsham, for 39760 Knepp Prudence 8th, born Aug. 8, 1927, calved May 25, 1932; s. Knepp Meadow Marquis 18097, d. 27063 Knepp Prudence by Sudbourne Crown 10808.
- 945 IV.—OWEN H. SMITH, Langham, Oakham, for 40587 Upton Queen B, born June 21, 1927, calved March 27, 1932, bred by W. L. Horbury, Ditchford Farm, Moreton-in-the-Marsh; s. Hatton Fabulist 11985, d. 31504 Necton Queenie by Marham Armistice 11460.
- 940 E.N.—CAPTAIN SIR H. E. DE TRAFFORD, BART., [Newsells Park, Barkway, Royston, Herts., for Newsells Vatsy. H.C.—937. C.—843.

Class 156.—Red Poll Heifers, born in 1930.

- 947 I.—HIS MAJESTY THE KING, Sandringham, Norfolk, for 46033 Royal Artifice, born Feb. 25; s. Hatton Faber 14151, d. 33079 Royal Ardentia by Royal Brigadier 12411.
- 956 II.—VISCOUNT TREDEGAR, Tredegar Park, Newport, Mon., for 43809 Tredegar Hallmark, born Feb. 23; s. Necton Gloucester 11423, d. 30809 Priory Lass by Polstead Kenneth 11755.
- 952 III.—N. A. HEYWOOD, Glevering Park, Wickham Market, Woodbridge, for 45298 Glevering Golden Plover, born Jan. 24; s. Yoxford Proud Prince 14392, d. 35388 Heveringham Bountiful by Ipswich General 12678. H.C.—954.

Class 157.—Red Poll Heifers, born in 1931.

- 957 I.—HIS MAJESTY THE KING, Sandringham, Norfolk, for 48025 Royal Verbena, born Jan. 4; s. Hatton Faber 14151, d. 40240 Royal Violet by Royal Crimson 11783.

¹ Prizes, except Fourth, given by the Red Poll Cattle Society.

² Champion Prize of £5 given by the Red Poll Cattle Society for the best Cow or Heifer.

Awards of Live Stock Prizes at Southampton, 1932. ci

- 964 II.—THE HON. CLIVE PEARSON, Parham, Pulborough, Sussex, for 47892 Parham Ripple, born March 3; s. Marsden Mintmate 15025, d. 33211 Sporie Royal Rill by Helma Strong 11993.
- 962 III.—J. N. KENDALL, Brimpsfield Park, Gloucestershire, for 46766 Brimpsfield Bee, born Jan. 4; s. Brimpsfield Barrister 14456, d. 40823 Basildon Tea Rose by Basildon Conqueror 13646.
- 959 IV.—N. A. HEYWOOD, Glevering Park, Wickham Market, Woodbridge, for 47226 Glevering Chough, born Jan. 2; s. Bredfield Romulus 5th 14049, d. 38386 Glevering Raven by Easton Pilgrim Father 12597.
- 965 R.N.—THE HON. CLIVE PEARSON, for Parham Rosie.
H.C.—961, 963. C.—967.

Blue Albions.

Class 158.—Blue Albion Bulls, born in or before 1929.

- 968 I. & Champion.—T. H. CALDERBANK, The Hall, Stow Maries, Chelmsford, for Stow What's Wanted 1969, born May 3, 1929; s. Stow Manners 1579, d. Stow Cicely 11520 by Broomhill Threshold 499.
- 971 II.—W. E. GLOVER, The Shrubberies, Snarestone, Burton-on-Trent, for Snarestone Jester 1799, born May 29, 1928; s. Burton Jude 2nd 1183, d. Snarestone Faithful 7024.
- 972 III.—RANDOLPH TORY, Charisworth Farm, Blandford, for Charisworth Ruby 2nd, born June 15, 1929; s. Cowleaze Champion 1661, d. Charisworth Polly 8298.

Class 159.—Blue Albion Bulls, born in 1930.¹

- 978 I.—JOHN BASSETT, Hill Top Farm, Ashover, Derbyshire, for Mount Martenstown 1909, born Sept. 4, bred by T. H. Swire & Sons, Mount Farm, Norton-in-Hales, Market Drayton; s. Mount Fearless 1781, d. Mount Ethel 12128 by Mount Champion 1045.
- 974 II.—JAMES WALL, Bridge House, Rowsley, Derbyshire, for Woodland King 1985, born Aug. 29; s. Asherblue Clansman, d. Hassop Queenie 11192 by Charisworth Champion 259.

Class 160.—Blue Albion Bulls, born in 1931.²

- 976 I. & R.N. for Champion.—T. H. CALDERBANK, The Hall, Stow Maries, Chelmsford, Walden Manners, born Jan. 12, bred by A. T. Greenslade, Little Walden Park, Saffron Walden; s. Chilcote Blue Boy 1505, d. Walden Clara 7650.
- 977 II.—W. E. GLOVER, The Shrubberies, Snarestone, Burton-on-Trent, Snarestone Leader, born May 15; s. Snarestone Jester 1799, d. Snarestone Fashion 3rd 12376 by Barton Jude 2nd 1183.
- 981 III.—F. J. T. MEW, Kingston Manor, Chillerton, Isle of Wight, for Kingston Conqueror, born Feb. 20; s. Stow Manners 1579, d. Ridgwardine Viola 9760.
- 980 R.N.—F. J. T. MEW, for Kingston Baron.
H.C.—979. C.—978.

Class 161.—Blue Albion Cows or Heifers, in-milk, born in or before 1929.

- 983 I. & R.N. for Champion.—PERCY DOBSON, Manor Farm, Ridgwardine, Market Drayton, for Remotes of Ridgwood 417 SR, born in Sept., 1926, calved Feb. 27, 1932, breeder unknown.
- 982 II.—T. H. CALDERBANK, The Hall, Stow Maries, Chelmsford, for Stow Cicely 11520, born Dec. 8, 1925, calved May 16, 1932; s. Broomhill Threshold 499, d. Mariet of Stow 119 SR.
- 985 III.—HENRY MATTHEWS, Winterbourne, Bristol, for Iris of Winterbourns 426 SR, born in Sept., 1926, calved June 11, 1932, bred by H. Wear and Sons, Congresbury, Bristol.
- 984 R.N.—PERCY DOBSON, for Ridgwardine Daisy 2nd.
H.C.—987.

Class 162.—Blue Albion Heifers, born in 1930.

- 986 I. & Champion.—JOHN BASSETT, Hill Top Farm, Ashover, Derbyshire, for Asherblue Trixie 12550, born Sept. 1; s. Asherblue Clansman 1429, d. Pike Trixie 11368.
- 990 II.—PERCY DOBSON, Manor Farm, Ridgwardine, Market Drayton, for Ridgwardine Lassie 2nd 12358, born July 25; s. Stow Manners 1579, d. Ridgwardine Lassie 10586 by Elton Monarch 301.
- 998 III.—HENRY MATTHEWS, Winterbourne, Bristol, for Farnborough Marigold, born June 9, bred by R. H. A. Holbeck, Farnborough, Banbury; s. Ridgwardine Regent 1781, d. Barton Marigold 10886 by Bank Champion 188.

¹ Perpetual Silver Challenge Cup given by the Blue Albion Cattle Society for the best Bull.

² Prizes given by the Blue Albion Cattle Society.

³ Perpetual Silver Challenge Cup given by the Blue Albion Cattle Society for the best Cow or Heifer.

cii *Awards of Live Stock Prizes at Southampton, 1932.*

- 992 R.N.—J. J. JONES, The Mount, Farnborough, Banbury, for Farnborough Crocus 12702, born March 17, bred by R. H. A. Holbeck, Farnborough, Banbury; s. Ridgwardine Regent 1781, d. Willenhall Pansy 8028.
H.C.—889. C.—891, 994.

Class 163.—*Blue Albion Heifers, born in 1931.*¹

- 995 I.—PERCY DOBSON, Manor Farm, Ridgwardine, Market Drayton, for Ridgwardine Lucy, born April 2; s. Stow Manners 1579, d. Ridgwardine Dnybell 6880.
996 II.—W. E. GLOVER, The Shrubberies, Snarestone, Burton-on-Trent, for Snarestone Mischief 4th, born Oct. 22; s. Snarestone Jester 1799, d. Snarestone Mischief 2nd 10666 by Mountain Count.
997 III.—J. J. JONES, The Mount, Farnborough, Banbury, for Farnborough Forget-Me-Not, born June 30; s. Farnborough Major 1877, d. Seagry Melody 6870.
998 R.N.—HENRY MATTHEWS, Winterbourne, Bristol, for Winterbourne Strawberry.

British Friesians.

The letters F.R.S. after the number of an animal indicate that such animal is registered in the Friesch Rundee Stamboek (Friesland Cattle Herd Book) Zwartebonte (Black and White) Section.

The letters F.H.B., S.A., after the number of an animal indicate that such animal is registered in the Friesland Herd Book, South Africa.

The letters S.A.S.B. after the name of an animal indicate that such animal is registered in the South African Stud Book.

The letters P.I. after the name of an animal indicate that such animal is of pure imported Friesian (Holland) or South African blood.

Unless otherwise stated the number refers to the British Friesian Herd Book.

Class 164.—*British Friesian Bulls, born in or before 1929.*²

- 999 I., \$20, Champion,* & Champion.—A. J. CREED, Goldicote House, Stratford-on-Avon, for Astonville Duke 32199, born Sept. 19, 1927, bred by W. H. R. Gilbert, The Cottage, Aston Flamville, Hinckley; s. Tarvin Janke's Mazeppa 24357 P.I., d. Hedges Peggy 53480 by Petygards (imp.) Bles Albert 4321.
1001 II., \$15.—GEORGE GEE, Ely Grange, Frant, Sussex, for Glyndebourne Achilles 31043 P.I., born Oct. 7, 1928, bred by Capt. John Christie, M.C., Glyndebourne, Lewes; s. Hache Achilles 22919 P.I., d. Glyndebourne (imp. 1922) Karkka 61788 by Rikus 6542 F.R.S.
1005 III., \$10.—MRS. PERCY TORY, Shapwick, Blandford, for Crawford Bravo 35553, born Oct. 9, 1929; s. Crawford Nels Rust Beatty 32543, d. Crawford Eileen 91768 by Crawford (imp. 1922) Beatty 6th 19689.
1008 R.N.—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., Douneside, Tarland, Aboyne, for Douneside Masterpiece.

Class 165.—*British Friesian Bulls, born on or between January 1 and June 30, 1930.*

- 1011 I.—SIR ERNEST S. WILLS, BART., Littlecote, Hungerford, for Hales Burelma 2nd 37467 P.I., born Jan. 30, bred by Ernest B. Hall, Hales Hall, Market Drayton; s. Hache Buringa 25871 P.I., d. Hales Trethelma 2nd 71858 P.I. by Dunninald Kurrijploh 13351 P.I.
1008 II.—PIDDINGTON (NORTHANTS) ESTATES, LTD., Horton, Northampton, for Piddington Rastus 37911, born March 2; s. Hache Festus 34325 P.I., d. Quinton Regina 75516 by Knebworth (imp. 1922) Zondag 20611.
1007 III.—F. J. CARTER, Gardeners Farm, Beehive Lane, Galleywood, Chelmsford, for Lawford Jachin 37667, born Jan. 20, bred by H. & B. Poole, Akenham Hall, Ipswich; s. Henbury Karel Conjuror 26019 P.I., d. Lawford Agnes 54576 by Clockhouse Boterbloss 9811.

Class 166.—*British Friesian Bulls, born on or between July 1 and December 31, 1930.*

- 1014 I.—F. N. TERRY, Chebbard, Puddletown, Dorchester, for Glen Ceres Warrego 37833, born Aug. 22, bred by Arthur Allen, Manor House, Chesterblade; s. Kingswood Ynteries 14531, d. Glen Wanganni 116474 by Glen Ceres 28611.
1012 II.—ERNEST B. HALL, Hales Hall, Market Drayton, for Hales Chablis 37477, born Oct. 29; s. Hache Buringa 25871 P.I., d. Hache Deshabille 105896 by Hache Corjan Ulysses 14165 P.I.

¹ Prizes given by the Blue Albion Cattle Society.

² Prizes given by the British Friesian Cattle Society.

³ Champion Prize of £10 given by the British Friesian Cattle Society for the best Bull.

⁴ The "Mayford" Silver Challenge Trophy given through the British Friesian Cattle Society for the best Bull.

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- 1015 III.—WILLIAM TURNER, Offerton, Hindlip, Worcester, for Hawthorn Jason 87583, born Sept. 19; s. Hache Bravery 25883, d. Hawthorn Japonica 105784 by Hedges Anema 20208.
1018 R.N.—JOSEPH ILLIFFE, Port House, Coventry Road, Hinckley, for Progress King Bacchus 2nd.

Class 167.—British Friesian Bulls, born on or between January 1 and June 30, 1931.

- 1022 I, R.N. for Champion,¹ R.N. for Champion,¹ & Champion.²—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., Douneside, Tarland, Aboyne, Aberdeenshire, for Douneside Morris 88857, born Feb. 26; s. Lochlands Rijper 29237 P.I., d. Douneside Molly 3rd 104008 by Hache Apollo 22925 P.I.
1028 II & R.N. for Champion.³—BERTRAM PARKINSON, Creskeld Hall, Arthington, Leeds, for Creskeld Beatty's Ceres 38741, born Feb. 12; s. Northdean Meibloem's Beatty 26679 P.I., d. Creskeld Hazeline 3rd 103334 by Haydon Mazeppa 23051 P.I.
1019 III.—JOHN HORRIDGE, Plas Llanfair, Llanfair P.G., Anglesey, for Llanfair Neeltjes Kuperus 39803 P.I., born April 30; s. Holyport Kuperus 34483 P.I., d. Llanfair Neeltje 2nd 118566 P.I. by Llanfair Paul 20755 P.I.
1024 IV.—LORD RAYLEIGH, The Bury, Hatfield Peverel, Chelmsford, for Terling Cosmos 39733 P.I., born May 24; s. Terling (imp. 1922) Marthus 21533, d. Terling Collona 5th 121786 P.I. by Bulkeley Kluske's Second Lodewijk 19428 P.I.
1026 V.—JOHN R. UPSON, Rush Court, Wallingford, for Saracens Meibloem Eddy 39857 P.I., born April 30; s. Hache Burinze 25873 P.I., d. Northdean Meibloem 5th 96982 P.I. by Northdean (imp. 1922) Marthus Beatty 21081.
1021 R.N.—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., for Douneside Benefactor 3rd.
C.—1017.
1022, 1082, 1089 Trophy.⁴—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., for Douneside Morris, Douneside Albert's Minnie and Douneside May.
1023, 1099, 1108 R.N. for Trophy.⁴—BERTRAM PARKINSON, for Creskeld Beatty's Ceres, Creskeld Piper 7th and Creskeld Lotus 10th.

Class 168.—British Friesian Bull, born on or between July 1 and December 31, 1931.

- 1028 I.—ETHELBERT FURNES, Hamels Park, Buntingford, Herts., for Hamels Neptune 39077, born Aug. 6; s. Hamels Lusty Lad 85881, d. Hamels Japonica 116886 by Hamels Paulus Potter 22989 P.I.
1032 II.—W. H. R. GILBERT, The Cottage, Aston Flamville, Hinckley, for Astonville Duke 11th 88883, born Sept. 8; s. Astonville Duke 32199, d. Wychnor Bluebell 3rd 67736 by Wychnor Frits 7215 P.I.
1031 III.—W. H. R. GILBERT, for Astonville Duke 10th 38381, born Sept. 7; s. Astonville Duke 32199, d. Sudbourne Dairymaid 42182 by Golf (imp.) Botermijn 8919.
1030 R.N.—GEORGE GEE, Ely Grange, Frant, Sussex, for Mayford Mars Pearl.

Class 169.—British Friesian Cows, in-calf.⁵

- 1038 I. & Champion.⁶—A. J. CREED, Goldicote House, Stratford-on-Avon, for Hawthorn Japonica 105784, born Jan. 27, 1926, bred by W. Turner, Offerton Farm, Hindlip, Worcester; s. Hedges Anema 20208, d. Hawthorn Edna 53364 by Moray Master 8377.
1040 II.—LORD RAYLEIGH, The Bury, Hatfield Peverel, Chelmsford, for Terling Unique 2nd 87904, born Oct. 31, 1924; s. Terling (imp. 1922) Marthus 21533, d. Terling Unique 49296 by Terling (imp.) Vic Bertus 4541.
1039 III.—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., Douneside, Tarland, Aboyne, Aberdeenshire, for Douneside Beryl 2nd 103990, born Dec. 1, 1928; s. Hache Apollo 22925 P.I., d. Douneside Benbecula 3rd 70588 by Douneside Hatsumerschaap 18719 P.I.
1037 R.N.—CAPT. JOHN CHRISTIE, M.C., Glyndebourne, Lewes, for Haydon Pilot's Cornflower.
1038, 1061, 1087 Cup.⁷—A. J. CREED, for Hawthorn Japonica, Hawthorn Katja and Goldicote Betty Egerton.

¹ Champion Prize of £10 given by the British Friesian Cattle Society for the best Bull.

² The "Mayford" Silver Challenge Trophy given through the British Friesian Cattle Society for the best Bull.

³ The "Douneside" Silver Challenge Cup given through the British Friesian Cattle Society for the best Bull, bred by Exhibitor.

⁴ Perpetual Bronze Challenge Trophy given by the Friesland Cattle Breeders' Association of South Africa for the best group of three animals bred by Exhibitor.

⁵ Prizes given by the British Friesian Cattle Society.

⁶ Champion Prize of £10 given by the British Friesian Cattle Society for the best Cow or Heifer.

⁷ Silver Challenge Cup given through the British Friesian Cattle Society for the best group of three Cows or Heifers.

civ *Awards of Live Stock Prizes at Southampton, 1932.*

Class 170.—British Friesian Cows, in-milk, born in or before 1926, having yielded a minimum of 8,000 lb. of milk during a lactation period of 315 days.¹

- 1052 I., \$20.—R. C. E. RANSOME, The Ashes, Stowmarket, for Ryburgh Dulcise 109844, born Nov. 11, 1926, calved June 6, 1932, bred by A. J. Savory, Great Ryburgh, Norfolk; s. Wyken African Premier 24668, d. Ryburgh Tilly 56724 by Rhvd Statesman 12561.
- 1053 II., \$15.—LORD RAYLEIGH, The Bury, Hatfield Peverel, Chelmsford, for Terling Torch 36th 87892, born Sept. 22, 1924, calved May 4, 1932; s. Terling (imp. 1922) Marthus 21583, d. Terling Torch 18th 81206 by Terling Dutchman 5643.
- 1057 III., \$10.—STRUTT & PARKER (FARMS), LTD., The Bury, Hatfield Peverel, Chelmsford, for Lavenham Jess 2nd 95616, born Aug. 18, 1925, calved April 24, 1932; s. Lavenham Black Boy 20719, d. Lavenham Jess 63538 by Terling Chief 15475.
- 1047 IV., \$4.—CAPT. JOHN CHRISTIE, M.C., Glyndebourne, Lewes, for Glyndebourne Hannah 3rd 93630, born Oct. 27, 1925, calved June 3, 1932; s. Glyndebourne (imp. 1922) Rikus 20111, d. Glyndebourne Hannah 61786 by Hache Cerbert Viking 17107.
- 1059 V., \$3.—JOHN R. UPSON, Rush Court, Wallingford, for Moulsoe Elsie 2nd 108184, born Jan. 12, 1926, calved May 17, 1932, bred by Randall Bros., Moulsoe, Newport Pagnell; s. Moulsoe Golden King 18087, d. Moulsoe Elsie 74336 by Felhampton Cautious 13947.
H.C.—1054, 1055, 1056.

Class 171.—British Friesian Cows, in-milk, born in 1927 or 1928, having yielded a minimum of 6,500 lb. of milk during a lactation period of 315 days.¹

- 1061 I., \$20.—A. J. CREED, Goldicote House, Stratford-on-Avon, for Hawthorn Katja 117076, born May 6, 1927, calved June 20, 1932, bred by W. Turner, Offerton, Hindlip, Worcester; s. Brampton Hilko 24971, d. Hawthorn Harebelle 82768 by Hedges Anema 20293.
- 1062 II., \$15.—MAJOR B. M. EDWARDS, M.C., Hardingham Hall, Norwich, for Hardinghall Dairymaid 4th 116960, born Aug. 9, 1927, calved May 30, 1932; s. Northdean Hollander 4th 26675 P.I., d. Teston Silver Lead 49332 by Terling (imp.) Verwachting 4543.
- 1066 III., \$10.—LORD RAYLEIGH, The Bury, Hatfield Peverel, Chelmsford, for Terling Torch 43rd 121838, born June 2, 1927, calved May 1, 1932; s. Terling (imp. 1922) Marthus 21583, d. Terling Torch 27th 68712 by Dunnald Haeyemairschaap 7699 P.I.
- 1067 IV., \$4.—WILLIAM TWENTYMAN, Moor Court, Sparsholt, Winchester, for Winchester Astral 122614, born Jan. 7, 1927, calved June 3, 1932; s. Winchester Verwachting Victor 21737, d. Winchester Aster 67546 by Horton Winterboterminj 9945.
H.C.—1068.

Class 172.—British Friesian Heifer, in-milk to first calving, born on or after January 1, 1929.¹

- 1073 I.—R. C. E. RANSOME, The Ashes, Stowmarket, for Sukar Bouquet 141708, born June 27, 1929, calved March 28, 1932; s. Hache Buringa 25871 P.I., d. Moordale Bouquet 5th 96606 by Moordale (imp. 1922) Paul 20965.
- 1070 II.—ETHELBERT FURNESS, Hamels Park, Buntingford, Herts., for Hamels Lipstick 187394, born June 21, 1929, calved May 15, 1932; s. Glyndebourne Achilles 81048 P.I., d. Hamels Godiva 82566 by Seaton Roland 10593 P.I.
- 1074 III.—JOHN R. UPSON, Rush Court, Wallingford, for Saracens Lass 141070, born Aug. 14, 1929, calved June 1, 1932; s. Saracens Melbloom Beatty 83449 P.I., d. Richings Dairy Lass 86768 by Kingswood King Ceres 17563.

Class 173.—British Friesian Heifers, born on or between January 1 and June 30, 1930.

- 1082 I. & R.N. for Champion.¹—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., Douneside, Tarland, Aboyne, Aberdeenshire, for Douneside Albert's Minnie 145890, born Feb. 10; s. Douneside Masterpiece 19835, d. Douneside Albert's Minna 92510 by Douneside Hatsumerschaap 18719 P.I.
- 1083 II.—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., for Douneside Beaula 5th 145894, born June 4; s. Douneside Masterpiece 19835, d. Douneside Beaula 70886 by Douneside Hatsumerschaap 18719 P.I.
- 1075 III.—ARTHUR ALLEN, The Manor, Chesterblade, Somerset, for Glen Walmae 2nd 146918, born April 23; s. Glen Akirin 81035, d. Glen Waiwera 82144 by Kingswood Ynteseries 14531.

¹ Prizes given by the British Friesian Cattle Society.

² Champion Prize of \$10 given by the British Friesian Cattle Society for the best Cow or Heifer.

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- 1081 IV.—JOSEPH ILIFFE, Port House, Coventry Road, Hinckley, for Progress Juliana 150518, born March 5; s. Astonville Vic-Beatty 80341, d. Progress Nicely 120456 by Hedges-Bies Jan 28799.
- 1085 R.N.—CAPT. F. E. STOBART, Abingworth, Pulborough, Sussex, for Abingworth Favourite, H.C.—1079.
- 1082, 1089, 1098 R.N. for Cup.¹—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., for Douneside Albert's Minnie, Douneside May and Douneside Lala 2nd.

Class 174.—British Friesian Heifers, born on or between July 1 and December 31, 1930.

- 1089 I.—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., Douneside, Tarland, Aboyne, Aberdeenshire, for Douneside May 145920, born Oct. 11; s. Douneside Hollander 4th 84157 P.I., d. Douneside Molly 4th 115383 by Lochlands Hollander 29285 P.I.
- 1087 II.—A. J. CREED, Goldcote House, Stratford-on-Avon, for Goldcote Betty Egerton 147010, born Sept. 19; s. Douneside Isleman 3rd 34159, d. Hache Betty Egerton 82890 by Hache Cerjan Ulysses 14165 P.I.
- 1088 III.—ERNEST B. HALL, Halses Hall, Market Drayton, for Halses Afke 2nd 147172 P.I., born July 17; s. Hache Buringa 25871 P.I., d. Halses Afke 93862 P.I. by Dunningald Kurrijploh 18851 P.I.
- 1093 R.N.—JOHN R. URSON, Rush Court, Wallingford, for Saracens Myrtle.

Class 175.—British Friesian Heifers, born on or between January 1 and June 30, 1931.²

- 1098 I.—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., Douneside, Tarland, Aboyne, Aberdeenshire, for Douneside Lala 2nd 155742, born April 1; s. Douneside Masterpiece 19835, d. Douneside Lala 126014 by Douneside Pel Klaas 80901 P.I.
- 1099 II.—BERTRAM PARKINSON, Creskeld Hall, Arthington, Leeds, for Creskeld Piper 7th 155264, born April 29; s. Northdean Meibloems Beatty 26879 P.I., d. Creskeld Piper 3rd 114750 by Creskeld Pel Knol 25343 P.I.
- 1096 III.—ETHELBERT FURNESS, Hamels Park, Buntingford, Herts., for Hamels Nick O'Time 157102, born June 30; s. Hamels Lusty Lad 35881, d. Blyth Elsie 118102 by Hamels Froukje's Roland 22985 P.I.
- 1097 R.N.—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., for Douneside Bertus Minna 4th.

Class 176.—British Friesian Heifers, born on or between July 1 and December 31, 1931.²

- 1108 I.—BERTRAM PARKINSON, Creskeld Hall, Arthington, Leeds, for Creskeld Lotus 10th 155262, born July 1; s. Creskeld Knierke Beatty 85565 P.I., d. Creskeld Lotus 5th 125570 by Northdean Meibloems Beatty 26879 P.I.
- 1106 II.—THE TRUSTEES OF SIR ALASDAIR W. MACROBERT, BART., Douneside, Tarland, Aboyne, Aberdeenshire, for Douneside Aster 3rd 155730, born July 23; s. Lochlands Ripper 29287 P.I., d. Douneside Anice 103982 by Hache Apollo 22925 P.I.
- 1105 III.—A. J. HILL, Denton Park, Ben Rhydding, Yorks., for Ahill Vixen 152804, born Dec. 12; s. Bartonleoley Trevor 82267, d. Knebworth Ceres Vixen 117952 by Knebworth (Imp. 1922) Ceres 2nd 20607.
- 1102 R.N.—ARTHUR ALLEN, Manor House, Chesterblade, Somerset, for Glen Bella 2nd. H.C.—1110.

Ayrshires.

Class 177.—Ayrshire Bulls, born on or before September 1, 1931.

- 1116 I. & Champion.³—ADAM W. MONTGOMERIE, Lessmessock, Ochiltree, Ayrshire, for Bargenoch Blue Ribbon 81923, born Nov. 14, 1929, bred by John Logan, Bargenoch, Drongan, Ayrshire; s. Mossiel Encore 27500, d. Bargenoch Theresa 12090 by Low Milton Archer 28019.
- 1118 II.—E. GREENSHIELDS, Ivy House, East Harrington, Sunderland, for Catlins Barquants 80846, born Jan. 7, 1929, bred by Matthew Cochrane, Catlins, Lockerbie; s. Catlins Felix 28676, d. Catlins Judy 3rd 76940 by Netherall Reserve 17508.

¹ Silver Challenge Cup given through the British Friesian Cattle Society for the best group of three Cows or Heifers.

² Prizes given by the British Friesian Cattle Society.

³ The "Cowhill" Silver Challenge Cup given through the Ayrshire Cattle Herd Book Society for the best Ayrshire. A Prize of £5 is given by the Ayrshire Cattle Herd Book Society to the winner of the Cup each year.

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- 1117 III.—NATIONAL SOCIETY FOR EPILEPTICS, Chalfont Colony, Gerrards Cross, Bucks., for Auchenbrain Revelation 80408, born Feb. 1, 1930, bred by David Wallace, Auchenbrain, Mauchline; s. Lyonston Douglas 25768, d. Auchenbrain White Rose 3rd 78748 by Auchenbrain British Chief 18458.
1112 R.N.—SAMUEL GRAHAM, Horton Hall, Small Dole, Henfield, Sussex, for Hobland Platinum.

Class 178a.—Ayrshire Cows, in-milk, born on or before September 1, 1928.

- 1136 I.—A. & A. KIRKPATRICK, Barr, Sanquhar, Dumfries, for Barr Lorna Doone 18918, born June 13, 1927, calved June 10, 1932; s. Dalgig Speculation 24989, d. Barr Dusky Maid 68931 by Drumsue Galety 13250.
1145 II. & Champion.—F. H. SANDERSON, Eshott Pedigree Stock Farms, Felton, Northumberland for Auchenbrain Miss Craig 34th 98389, born March 9, 1924, calved June 17, 1932, bred by D. Wallace, Auchenbrain; s. Southraig Footprint 19958, d. Auchenbrain Miss Craig 12th 57845 by Lessnessock Kerensky 16026.
1126 III. & R.N. for Champion.—ROBERT CROSS, Knockdon, Maybole, Ayrshire, for Knockdon Beautiful 2068, born April 3, 1925, calved June 21, 1932; s. Knockdon Norman 23892, d. Knockdon Beauty 62573 by Knockdon Prince John 12660.
1181 IV.—WILLIAM L. FERGUSON, Cairnwell, Sandhead, Stranraer, for Rainton Sally 14th 98676, born March 7, 1923, calved July 4, 1932, bred by W. T. Sprout, Rainton, Gatehouse; s. Dunlop Convener 17244, d. Rainton Sally 8th 62775.
1148 R.N.—ROBERT SILLARS & SON, Ickham Court, Canterbury, for Ickham Carol.

Class 178b.—Ayrshire Cows, in-calf, born on or before September 1, 1928.

- 1140 I. & R.N. for Champion.—DUGALD MACKAY, Lea Farm, Watford, for Mackay's Princess 2nd, born June 8, 1926; s. Mackay's Top Grade 27902, d. Bruchag Pearl 12th 84725 by Grange Gold Crest 19048.
1135 II.—A. & A. KIRKPATRICK, Barr, Sanquhar, Dumfries, for Barr Hetty 94806, born Jan. 6, 1924; s. Drumsue Galety 13250, d. Fairfield Mains Betty 68953 by Townhead Non Such 12552.
1122 III.—H. J. CLARK, Oldner House, Chipping Norton, for Oldner Cherry Blossom 2nd 21385, born June 11, 1923; s. Ickham Mascot 24352, d. Oldner Cherry Blossom 8946 by Riggs Jupiter 19483.
1123 IV.—H. J. CLARK, for Oldner Maggie 13177, born Nov. 29, 1926; s. Ickham Mascot 24352, d. Caigton Maggie 7th 89734 by Hobland Lucky Star 19597.
1142 R.N.—WILLIAM MACKAY, Suttons Farm, St. Albans, for Cauldhame Katherine 3rd.

Class 179a.—Ayrshire Cows or Heifers, in-milk, born after September 1, 1928, and before September 1, 1930.¹

- 1167 I.—ROBERT SILLARS & SON, Ickham Court, Canterbury, for Ickham Carol 4th 35043, born Oct. 23, 1923, calved June 23, 1932; s. Greenan Masterpiece 25328, d. Ickham Carol 10682 by Westburn Cupbearer 22197.
1158 II.—ROBERT CROSS, Knockdon, Maybole, Ayrshire, for Knockdon Derby Girl 24406; born Oct. 15, 1923, calved June 13, 1932, bred by the late Thomas Cross, Knockdon; s. Dalgig Baron 23168, d. Knockdon Dairy Lass 8083 by Knockdon Norman 23892.
1162 III.—ALEXANDER D. MURCHIE, Bogside, Drongan, Ayrshire, for Bogside Butter Fat 39705, born Feb. 19, 1929, calved May 23, 1932; s. Bargenoch Dandy Desmond 26802, d. Bogside Fenella 39707 by Overton Foundation 17537.
1168 R.N.—NATIONAL SOCIETY FOR EPILEPTICS, Chalfont Colony, Gerrards Cross, for Chalfont Peeress.

Class 179b.—Ayrshire Cows or Heifers, in-calf, born after September 1, 1928, and before September 1, 1930.²

- 1160 I.—SAMUEL GRAHAM, Horton Hall, Small Dole, Henfield, Sussex, for Hobland Nancy 23rd 28714, born March 14, 1930, bred by Thomas Barr, Hobland, Monkton, Ayrshire; s. Howie's Investment 23427, d. Hobland Nancy 13th 35047 by Hobland Lucky Boy 18482.
1168 II.—ROBERT SILLARS & SON, Ickham Court, Canterbury, for Ickham Thelma 2nd 35068, born Oct. 21, 1923; s. Ickham Foundation 27011, d. Ickham Thelma 10648 by Auchenbrain Campaigner 24362.
1164 III.—LORD NUNBURNHOLME, Arthingworth Manor, Market Harborough, for Drumfork Muriel 29863, born Aug. 20, 1929, bred by Robert Howie, Drumfork, Helensburgh; s. Nether Craig Coronach 26678, d. Drumfork Nettle 3rd 87366 by Hobland Gold Bond 19595.
1153 R.N.—THOMAS BARR, Hobland, Monkton, Ayrshire, for Hobland Jean 8th.

¹ The "Oldner" Silver Challenge Cup given through the Ayrshire Cattle Herd Book Society for the best Cow or Heifer.

² The "Cowhill" Silver Challenge Cup given through the Ayrshire Cattle Herd Book Society for the best Ayrshire.

³ Prizes given by the Ayrshire Cattle Herd Book Society.

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Class 180.—*Ayrshire Heifers, born on or after September 1, 1930.*

- 1170 I.—THOMAS BARR, Hobsland, Monkton, Ayrshire, for Hobsland Janet 8th 55860, born Sept. 23, 1930; s. Netherall Enterprise 27359, d. Hobsland Janet 3rd 10749 by Caigton Here's Luck 22378.
- 1174 II.—ADAM W. MONTGOMERIE, Lessnessock, Ochiltree, Ayrshire, for Drongan Mains Rosabelle 89895, born Nov. 14, 1930, bred by D. & A. Mackie, Drongan Mains, Drongan, Ayrshire; s. Southraig Specialist 28155, d. Drongan Mains Valerie 17220 by Southraig Special 26327.
- 1176 III.—NATIONAL SOCIETY FOR EPILEPTICS, Chalfont Colony, Gerrards Cross, Bucks., for Chalfont Fun 2nd 39607, born Sept. 26, 1930; s. Craigaploch Crusader 27683, d. Eglinton Fun 7096 by Eglinton Mains Snow King 19734.
- 1177 R.N.—F. H. SANDERSON, Eshott Pedigree Stock Farms, Felton, Northumberland, for Eshott Vain Beauty.

Guernseys.

N.B.—Unless otherwise stated the numbers refer to the English Guernsey Herd Book.

Class 181.—*Guernsey Bulls, born in or before 1929.*

- 1185 I., R.N. for Champion¹ & R.N. for Champion.²—EDWARD GERRISH, Carrallack House, St. Just, Cornwall, for Valerie's Honour 9008, fawn and white, born Nov. 8, 1925, bred by W. B. Langlois, Les Caches, St. Peter's-in-the-Wood, Guernsey; s. Lady's Honour 4838 P.S., d. 19187 P.S. Valerie of Caches Farm by Polly's Governor des Ruettes 8906 P.S.
- 1188 II.—CAPT. COSMO DOUGLAS, Hazelby, Newbury, for Medora's Boy 7853, dark fawn, born May 30, 1929, bred by F. J. Torode, La Houquette, Castel, Guernsey; s. Dairyman 5th des Valleys 5462 P.S., d. 22982 P.S. Medora of la Houquette by Governor of Myrtle Place 5th 5445.
- 1193 III.—LADY SOPHIE SCOTT, Redenham House, Andover, for Kings Walden Butter Boy 7722, fawn and white, born March 9, 1929, bred by Major Harrison, Kings Walden Bury, Hitchin; s. Hornblotton May Boy 5093, d. 25308 Pat's Butterfat of Duvaux by Primrose's Butterfat 4535 P.S.
- 1184 IV.—W. DUNKELS, Fernhill Park, Windsor Forest, for Fernhill Robert 5th 7795, fawn and white, born April 23, 1929; s. Hindhead Robert 6th 5847, d. 14281 Downe Fleur of Vimiera by Valentine's Honour of the Passee 8326.
- 1180 V.—EDGAR E. ADAMS, The Oaks, Brambridge, Eastleigh, Hants., for Pilgrim of Myrtle Place 7586, fawn and white, born June 2, 1927, bred by E. de Garis, Myrtle Place, Castel, Guernsey; s. Echo of Myrtle Place 4796 P.S., d. 24438 P.S. La Fleur du Jardin's Princess 2nd by Bruser's Boy 4596 P.S.

Class 182.—*Guernsey Bulls, born in 1930.*

- 1206 I., Champion¹ & Champion.²—MRS. LIONEL PORTMAN, Eechinswell, Newbury, for Cyrenes Champion of Rose Farm 8994, fawn and white, born April 4, bred by J. F. Browning, Rose Farm, Guernsey; s. Cyrenes Cupid of Rose Farm 5887 P.S., d. 20279 P.S. May of La Mare by Sailor Lad des Ruettes 4109 P.S.
- 1203 II.—CARL HOLMES, Clover Top Farm, Codicote, Hitchin, for Tips Gem of Meadow View 8977, fawn and white, born June 15, bred by Mr. Carrington, Guernsey; s. Gem's Successor 5205 P.S., d. 23407 Golden Tip 6th of Vingtaine by Virtues Honour 4528 P.S.
- 1205 III.—DAME E. LOCKE KING, Brooklands, Weybridge, for Shiwa Rosey of Goodnestone's Lad 8365, fawn and white, born May 18; s. Beauty's Lad of the Rouvets 4894, d. 18291 Rosey of Goodnestone 15th by Rose Lad of Goodnestone 8163.
- 1211 IV.—R. C. VAUGHAN, Bushbury, Blackboys, Sussex, for Bushbury Surprise 8257, fawn and white, born Feb. 28; s. Elfordleigh Dandy 2nd 8360, d. 23443 Horablotton Molly by The Conqueror of Vimiera 4953.
- 1200 V.—DEBENHAM & TORY, Bladen Farms, Brintspuddle, Dorchester, for Bladen Rose Lad 8rd 8476, fawn and white, born July 12, bred by Sir Ernest Debenham, Bart.; s. Milton Rose Lad 7380, d. 24001 Bladen Gipsy 2nd by Passee Fancy's Boy 4892.
- 1212 R.N.—MRS. D. S. L. VERSCHOYLE, Brookhill, Wokingham, for Brookhill Belmont's Sequence.

Class 183.—*Guernsey Bulls, born in 1931.*

- 1223 I.—H. A. Y. DYSON, Daltons, Bolney, Sussex, for Noel of Chute 3903, fawn and white, born March 10, bred by W. A. Addinell, Chute Lodge, Wiltshire; s. Noel of Goodnestone 7287, d. 24206 Bitterne Mollie by Bitterne Emperor 3611.

¹ Champion Prize of 25 given by the English Guernsey Cattle Society for the best Bull.
² The "Calehill" Silver Challenge Cup given by the English Guernsey Cattle Society for the best Bull.

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- 1222 II.—W. DUNKELS, Fernhill Park, Windsor Forest, for Fernhill Slogan 3rd 8815, fawn and white, born Feb. 12; s. Lavender's Slogan of La Hougue 7839, d. 14281 Downe Fleur of Vimiera by Valentine's Honour of the Passee 8826.
 1227 III.—MRS. J. SUTCLIFFE PYMAN, Norsebury, Sutton Scotney, Hants., for Norsebury Lodestar 14th 8914, fawn and little white, born April 18; s. Sequel's Lodestar 2nd 4932, d. 21839 Rosey of Goodnestone 25th by Rose Lad of Goodnestone 3163.
 1226 IV.—HAROLD J. PILBROW, Mapleton, Edenbridge, for Rowanberry's Prince of Mapleton 9335, fawn and white, born Jan. 14; s. Mapleton Amusement 7178, d. 19247 Dorman's Rowanberry 1st by Trevabyn Mill 4064.
 1224 V.—J. CRAIG HARVEY, Lainston House, Winchester, for Lainston Rose Lad 8811, fawn and white, born Jan. 29; s. Fernhill Rose Lad 6482, d. 19596 Clatford Marie du Moulin 7th by Clatford Rosie's Sequel of Vimiera 8873.
 1217 R.N.—THE HON. MRS. COLBORNE VIVIAN, Bosahan, St. Martin, Helston, for Bosahan Fearless.

Class 184.—Guernsey Cows, in-milk, born in or before 1927.

- 1242 I., Champion¹ & Champion.²—MRS. J. SUTCLIFFE PYMAN, Norsebury, Sutton Scotney, Hants., for 26972 Sequel's May Belle 4th, fawn and white, born July 6, 1927, calved May 8, 1932, bred by Mrs. A. Le Patourel, La Ramee, St. Peter Port, Guernsey; s. Galaxy's Slogan 8405, d. 16182 P.S. Sequel's May Belle by Honoria's Sequel 2nd 2816 P.S.
 1237 II.—MRS. JERVOISE, Herriard Park, Basingstoke, for 24543 Herriard Sweet 4th, fawn and white, born June 24, 1926, calved May 12, 1932; s. Rose's Delight of Clos Bourel 4920, d. 17868 Herriard Sweet 3rd by Herriard Fanny's Osseo 4224.
 1244 III.—R. M. THORNELEY, Elm Grove, Kingsclere, Newbury, for 19472 Hadham Goldstream 21st, fawn and white, born July 3, 1923, calved May 15, 1932, bred by Messrs. C. Norman, Moor Place, Much Hadham, Herts.; s. Downe Star of Honey-moon 3909, d. 16538 Hadham Goldstream 15th by Ladoek Prince Albert 8550.
 1234 R.N.—SIR LOUIS B. BARON, BART., Holmbury House, Holmbury St. Mary, Dorking, for Desboro's Daisy.
 H.C.—1245. C.—1243.

Class 185.—Guernsey Cows or Heifers, in-milk, born in 1928 or 1929.³

- 1251 I., R.N. for Champion¹ & R.N. for Champion.²—W. DUNKELS, Fernhill Park, Windsor Forest, for 28077 Fernhill Rose 2nd, fawn and white, born March 28, 1928, calved May 26, 1932; s. Hindhead Robert 6th 5347, d. 18318 Fernhill Rose by Murrell Desmond 4263.
 1256 II.—MRS. J. SUTCLIFFE PYMAN, Norsebury, Sutton Scotney, Hants., for 32820 Norsebury May Belle, fawn and white, born Oct. 24, 1929, calved June 9, 1932; s. Norsebury Noel 6873, d. 26972 Sequel's May Belle 4th by Galaxy's Slogan 8405.
 1255 III.—SIR GORDON LEY, BART., Furze Down, King's Somborne, Hants., for 28329 Hindhead Lady Richmond 2nd, fawn and white, born May 8, 1928, calved June 14, 1932, bred by J. Body, Hindhead Court, Surrey; s. Lynchmere Lord Roberts 15th 3932, d. 22449 Hindhead Lady Richmond by Hindhead Governor 4842.
 1250 IV.—CAPT. COSMO DOUGLAS, Hazelby, Newbury, for 27826 Hazelby Sunshine, fawn and white, born Feb. 17, 1928, calved June 8, 1932; s. Hindhead Robert 4th 5488, d. 23213 Poltimore Ursula 2nd by Pengelly Boy's Sequel 4893.
 1261 V.—H. B. TURNER, Malverleys, Newbury, for 30426 Malverleys Buttercup, fawn and white, born March 19, 1929, calved June 12, 1932; s. Moundamere Honor 6883, d. 20084 Calehill Valentine by Lynchmere Lord Roberts 13th 8748.
 H.C.—1252, 1254. C.—1253, 1255.

Class 186.—Guernsey Heifers, born in 1930.

- 1269 I.—W. DUNKELS, Fernhill Park, Windsor Forest, for 33432 Fernhill Rosanne, fawn and white, born April 4; s. Fernhill Rose Lad 3rd 6860, d. 19257 Ladoek Rosanne by Stagenhoe Chief 4323.
 1268 II.—W. DUNKELS, for 32836 Fernhill Fleur 3rd, fawn and white, born March 7; s. Hindhead Robert 6th 5347, d. 14281 Downe Fleur of Vimiera by Valentine's Honour of the Passee 8826.
 1271 III.—MRS. JERVOISE, Herriard Park, Basingstoke, for 33450 Herriard Pride's Valentine, fawn and white, born May 23; s. Herriard Valentine's Honour's Bequest 6873, d. 29987 Brehan's Pride by Cyrene's Boy of Les Rouvets 4999 P.S.
 1273 IV.—MRS. J. SUTCLIFFE PYMAN, Norsebury, Sutton Scotney, Hants., for 32778 Norsebury Buttercup 3rd, fawn and white, born Jan. 24; s. Norsebury Noel 6876, d. 23628 Buttercup 2nd of North View by Winsome's Hero 4507 P.S.
 1270 R.N.—H. A. Y. DYSON, Dalton's, Bolney, Sussex, for Muriel 2nd of Pothill.
 H.C.—1264. C.—1274.

¹ Champion Prize of £5 given by the English Guernsey Cattle Society for the best Cow or Heifer.

² The "Fernhill" Silver Challenge Cup given by the English Guernsey Cattle Society for the best Cow or Heifer.

³ Prizes, except Fourth and Fifth, given by the English Guernsey Cattle Society.

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Class 187.—Guernsey Heifers, born in 1931.

- 1288 I.—SIR GORDON LEY, BART., Furze Down, King's Somborne, Hants., for 36022 Furze Down Melanie Rosebud, fawn and white, born May 24; s. Fernhill Rose Lad 6432, d. 23174 Melanie of Goodnestone 18th by Wintergreen's Slogan of Goodnestone 2nd 5208.
- 1280 II.—W. DUNKELS, Fernhill Park, Windsor Forest, for 36333 Fernhill Victorine 7th, fawn and white, born June 1; s. Lavender's Slogan of La Hougue 7839, d. 30362 Fernhill Victorine 6th by Hindhead Robert 6th 5847.
- 1281 III.—H. A. Y. DYSON, Daltons, Bolney, Sussex, for 36033 Barbara of Chute, fawn and white, born May 19, bred by W. A. Addinsell, Chute Lodge, Wiltshire; s. Noel of Goodnestone 7287, d. 27654 Peggy of Woodlands by Governor of La Genetiere 5097 P.S.
- 1289 IV.—HAROLD J. PILBROW, Mapleton, Edenbridge, for 35152 Mapleton Beatrice, fawn and white, born Jan. 6; s. Mapleton Rose Michael 7581, d. 28482 Mapleton Candies Beatrice by Candie's Warrior 4982 P.S.
- 1279 V.—CAPT. COSMO DOUGLAS, Hazelby, Newbury, for 35188 Hazelby Phyllis 4th, fawn and white, born Jan. 14; s. Candie's Queen's Fancy 7347, d. 18305 Rownham's Lady Phyllis by Dene Doctor 3877.
- 1290 R.N.—CAPT. J. B. SCOTT, Rotherfield Park, Alton, Hants., for Rotherfield Lassie. H.C.—1292, 1301. C.—1295, 1297.

Jerseys.

N.B.—In the Jersey Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Island Herd Book. A number without brackets indicates that the animal is registered in the English Jersey Herd Book.

Class 188.—Jersey Bulls, born in or before 1929.

- 1802 I. & Champion.—W. HUMPHRYS PRESCOTT, Highlands, Woldingham, Surrey, for Fairseat Gnome 16564, whole colour, born Nov. 1, 1928, bred by Cortlandt Taylor, Platt House Farm, Wrotham, Kent; s. Fairseat Future 16854, d. Fairseat Fairy 7819 by Mantle's Favourite 15068.

Class 189.—Jersey Bulls, born in 1930.

- 1811 I. & R.N. for Champion.—CORTLANDT TAYLOR, Platt House Farm, Wrotham, Kent, for Fairseat Majesty, whole colour, born Aug. 20; s. Fairseat Majestic 16720, d. Demure Princess (vol. 82, p. 309) by Broadlands Son 12858.
- 1812 II.—WILLIAM A. WHITE, Woodfold, Down Hatherley, Glos., for Hamlet's Glory of Highlands, broken colour, born April 18, bred by W. Humphrys Prescott, Highlands, Woldingham, Surrey; s. Aldbury Hamlet 16504, d. Gloria 4909 by Feather Knights Gamboge 14278.
- 1804 III.—CAPT. E. L. HUGHES, R.N., Spring Hill, Capel, Ipswich, for Jester, whole colour, born May 6; s. Michael 16613, d. Mulberry 8273 by Black Diamond 14945.
- 1805 IV.—SIR JOHN B. LLOYD, Foxbury, Stone Street, Sevenoaks, for Gamaster, whole brown, born March 6, bred by J. B. Michel, St. Peter, Jersey; s. Kahaka's Brampton Boy 16589, d. Belle of Les Geonnais (38887) by Amy's Cowslip Lad 18805.
- 1808 R.N.—MRS. ANNIE RANGELEY, Draycote, Rugby, for Toreador. H.C.—1808, 1809.

Class 190.—Jersey Bulls, born in 1931.

- 1824 I.—MRS. E. K. STAINES, Hook Farm, Leigh, Reigate, for Hook Adonis, whole colour, born June 16; s. Oreston Benedict 16629, d. Golden Mansion 6416 by Golden Fleece's Cid 14864.
- 1818 II.—CAPT. E. L. HUGHES, R.N., Spring Hill, Capel, Ipswich, for Jutland, whole colour, born April 12; s. Joubert 16587, d. Mischief 9784 by Black Diamond 14945.
- 1825 III.—HAYDON STEPHEN-FOX, Sharelands, Blackboys, Sussex, for Sharelands Pioneer Noble, broken colour, born Jan. 18; s. Cowdray Pioneer 11th 16254, d. Pearcelands Ivy 8859 by Young Masterstroke 14516.
- 1816 IV. & Champion.—MRS. EVELYN, Wotton House, Dorking, for Wotton Bonheur, whole colour, born Aug. 2; s. Wotton Airman 2nd 14502, d. Grosnez Sally 8898 by Bijou's Volunteer 16487.
- 1822 R.N. & R.N. for Champion.—W. HUMPHRYS PRESCOTT, Highlands, Woldingham, Surrey, for Glory Boy of Highlands, whole colour, born April 28; s. Fairseat Gnome 16564, d. Gloria 4909 by Feather Knights Gamboge 14278.
- H.C.—1814, 1817.

¹ Champion Prize of 25 given by the English Jersey Cattle Society for the best Bull.

² The "Meridale" Perpetual Silver Challenge Cup given through the English Jersey Cattle Society for the best yearling Bull from recorded dam.

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Class 191.—Jersey Cows, in-milk, born in or before 1928.

- 1847 I. & Champion.¹—H. CECIL PELLY, Venars, Nutfield, Surrey, for Flashlight's Josy 6354, broken colour, born Feb. 24, 1925, calved April 14, 1932, bred by J. St. C. Hamon, Trinity, Jersey; s. Flashlight 14998, d. Amy Josy 22735 P.S.C. by Financial Baron 11810.
- 1838 II. & R.N. for Champion.¹—SIR JOHN B. LLOYD, Foxbury, Stone Street, Sevenoaks, for Hamletta's Mistress 9414, whole colour, born March 24, 1927, calved April 17, 1932, bred by A. W. Ruggles-Brise, Spains Hall, Braintree; s. Lingen Sweep Time 15523, d. Hamletta 5th by Combination 2nd 11644.
- 1834 III.—MRS. EVELYN, Wotton House, Dorking, for War Planet 10268, whole colour, born March 14, 1926, calved April 8, 1932, bred by Lord Phillimore, Coppid Hall, Henley-on-Thames; s. Charm of War 15279, d. Sandstar 2nd 5590 by Wotton Sandstorm 14508.
- 1841 IV.—SIR HAROLD MACKINTOSH, Conyngham Hall, Knarborough, for Prudence 8483, whole colour, born July 1, 1925, calved May 10, 1932, bred by the Hon. Mrs. Esme Smyth, Ashton Court, Bristol; s. Mantle's Pride 14024, d. Grizel 1949 by General Mikado 18275.
- 1846 V.—H. CECIL PELLY, for Campaia's Gift 8977, whole colour, born April 17, 1927, calved June 18, 1932, bred by P. H. Le Brocq, St. Ouen's, Jersey; s. Bull's Eye 14557, d. Campaia 6087 by Dreaming Sultan 14600.
- 1840 R.N.—SIR HAROLD MACKINTOSH, for Highstead Friendship.
H.C.—1828, 1833, 1843, 1849, 1850.

Class 192.—Jersey Heifers, in-milk, born in 1929.

- 1868 I.—SIR JOHN B. LLOYD, Foxbury, Stone Street, Sevenoaks, for Arkona's Viscountess, broken colour, born March 18, calved April 23, 1932, bred by J. A. Romeril, St. Peter's, Jersey; s. Floral Dance's You'll Do 16568, d. Arkona 4th (28642) by April Wonder 12826.
- 1861 II.—LADY VIOLET HENDERSON, Buscot Park, Faringdon, for Ciroe, whole colour, born June 22, calved May 19, 1932, bred by Mrs. Carlton, Eastwood, Falfield, Glos.; s. The Slasher 14143, d. Disturbing Charm 6240 by You'll Do's Volunteer 14832.
- 1864 III. & Special, £10.—SIR HAROLD MACKINTOSH, Conyngham Hall, Knarborough, for Conyngham Sweet Thyme, whole colour, born April 18, calved June 29, 1932; s. Hussey's Frostie Wonder 16151, d. Lingen Sweet Thyme 3590 by Wotton Vervain's Moonlight 14505.
- 1859 R.N.—R. G. W. BERKELEY, Spetchley Park, Worcester, for Eastwood Jingle.
H.C.—1353, 1365.

Class 193.—Jersey Heifers, in-milk, born in 1930.²

- 1873 I. & Special, £5.—MRS. EVELYN, Wotton House, Dorking, for Wotton Betsinda, whole colour, born May 21, calved May 18, 1932; s. Wotton Airman 2nd 14502, d. War Betty 10252 by Charm of War 15279.
- 1882 II.—MRS. E. K. STAINES, Hook Farm, Leigh, Reigate, for Louisants, whole colour, born Jan. 4, calved April 18, 1932, bred by Mr. England, Jersey; s. Lord of the Isle 15884, d. Leucine (87599) P.S.H.C. by Ranulph 14428.
- 1867 III. & R.N. for Specials.¹—MRS. G. J. AUSTIN, Ellern Mede, Totteridge, Herts., for Bergamot, whole colour, born June 12, calved June 26, 1932; s. Majestic 15886, d. Ballerina 8855 by Rapallo 15545.
- 1875 IV.—LADY VIOLET HENDERSON, Buscot Park, Faringdon, for Lovely Lady, broken colour, born March 16, calved May 25, 1932; s. Fiery Aristocrat 16280, d. Una 11772 by Nimrod's Lion 18043.
- 1879 R.N.—H. CECIL PELLY, Venars, Nutfield, Surrey, for Fontaine's Royal Princess.
H.C.—1872.

Class 194.—Jersey Heifers, born in 1931.

- 1892 I.—R. G. SHAW, Platt House Farm, Wrotham, Kent, for Kentwins Heatha, broken colour, born May 17, bred by H. Cecil Pelly, Venars, Nutfield, Surrey; s. Kentwins Poppy's Aroma 16458, d. Kentwins Anchusa 11091 by Beau des Noyers 15925.
- 1893 II.—MRS. E. K. STAINES, Hook Farm, Leigh, Reigate, for Hook Fanny, broken colour, born May 29; s. Oreston Benedict 16629, d. Dovers Royal Moon Beam 6265 by Royal Kingdom 14446.
- 1884 III.—LADY VIOLET HENDERSON, Buscot Park, Faringdon, for Lady May Time, whole colour, born June 8, bred by A. W. Ruggles-Brise, Spains Hall, Braintree; s. Wotton Moonrise 17460, d. Lady Sweep Time by Blue Boy 16254.

¹ Champion Prize of £5 given by the English Jersey Cattle Society for the best Cow or Heifer.

² Special Prize of £10 (First Prize) and £5 (Second Prize) given by the English Jersey Cattle Society for the best Cows or Heifers in Classes 191 to 193, bred by Exhibitor, and milked out to the Judge's satisfaction before being judged.

³ Prizes, except Fourth, given by the English Jersey Cattle Society.

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- 1389 IV.—H. CECIL PELLY, Venars, Nutfield, Surrey, for Kentwins Katisha, broken colour, born May 16; s. Kentwins Poppy's Aroma 16453, d. Kentwins Cynthia 8042 by Wotton Airman 2nd 14502.
 1391 R.N.—W. HUMPHREYS PRESCOTT, Highlands, Woldingham, Surrey, for May Sweetbread of Highlands.
 H.C.—1883, 1894. C.—1885.
 Cup.¹—Mrs. E. K. STAINES.
 R.N. for Cup.¹—H. C. PELLY.

Kerrys.

N.B.—In the Kerry Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Royal Dublin Society's Herd Book. A number without brackets indicates that the animal is registered in the British Kerry Herd Book.

Class 195.—Kerry Bulls, born in or before 1930.

- 1397 I.—THE KERRY COW DAIRY FARMS, Laver-de-la-Haye, Colchester, for Valencia Linksman 496, born April 24, 1919, bred by Sir John FitzGerald, Bart., The Warren House, Stanmore, Middlesex; s. Valencia Chieftain 421, d. Valencia Meta (4122) by Valencia Lord (782).
 1398 II.—NEWTON R. STEEL, The Hookland Estate, Scaynes Hill, Haywards Heath, for Valencia Minstrel 607, born Nov. 28, 1924, bred by Sir John FitzGerald, Bart., The Warren House, Stanmore, Middlesex; s. Valencia Perry 616, d. Valencia Moya 5234 by Valencia Chieftain 421.
 1399 III.—W. MCA. HOUSTOUN, Sachel Court, Alfold, Billingshurst, for Sachel Erin 908, born July 1, 1930; s. Hattingley Edgar 801, d. Shamrock 2754 F.S.

Class 196.—Kerry Bulls, born in 1931.

- 1401 I.—NEWTON R. STEEL, The Hookland Estate, Scaynes Hill, Haywards Heath, for Hookland Bertie, born Jan. 24; s. Baunclune Tulwar 880, d. Valencia Bridget 4442 by Valencia Sammy 670.
 1400 II.—NEWTON R. STEEL, for Ard Caein Ultimo 920, born March 80, bred by the late S. J. Brown, Ard Caein, Naas, Co. Kildare; s. Ard Caein Secundus 749, d. Ard Caein Mimosa 11th 2215 by Shamrock Brian Sheen 851.
 1399 III.—THE KERRY COW DAIRY FARMS, Laver-de-la-Haye, Colchester, for Drumgaunagh Cornelius, born Sept. 2; s. Valencia Linksman 496, d. Drumgaunagh Countess Kathleen 4086 by Drumgaunagh Victory 508.

Class 197.—Kerry Cows, in-milk, born in or before 1928.

- 1411 I. & Champion.¹—NEWTON R. STEEL, The Hookland Estate, Scaynes Hill, Haywards Heath, for Muckross Moscow 5000, born Aug. 10, 1924, calved April 16, 1932, bred by A. R. Vincent, Muckross, Killarney, Ireland; s. Muckross Nosegay (1126), d. Muckross Mouskie (4631) by Duv Bidd (784).
 1404 II.—Miss H. K. A. GOSSLING, The Wilderness, Milford-on-Sea, Hants., for Cheshelbourne Fan 4507, born April 17, 1926, calved April 80, 1932, bred by Mrs. Freeland, The Manor House, Cheshelbourne, Dorchester; s. Duv Demon 640, d. Pallas Fairy 3435 by Pallas Paddy 2nd (810).
 1409 III.—H. E. MITCHELL, Great Pellingbridge Farm, Scaynes Hill, Haywards Heath, for Ard Caein Dove 3831, born May 11, 1922, calved June 18, 1932, bred by the late S. J. Brown, Ard Caein, Naas, Co. Kildare; s. Ard Caein Prince 6th 428, d. Duv Time 2252 by Duv Headford (707).
 1408 R.N.—LAURENCE CURRIE, Minley Manor, Farnborough, for Minley Letty.

Class 198.—Kerry Heifers, in-milk, born in 1929 or 1930.

- 1416 I. & R.N. for Champion.¹—T. WATTS, Warwick Lodge, Redhill, for Mangerton Water Lily 4748, born May 22, 1929, calved June 28, 1932; s. Hattingley Cuthbert 723, d. O.P.H. Watersheen Waterville 2468 by Mangerton Dermot 8rd 888.
 1412 II.—LAURENCE CURRIE, Minley Manor, Farnborough, for Minley Joyce, born June 9, 1929, calved May 11, 1932; s. Drumgaunagh Black Beauty 717, d. Minley Freda 4164 by Minley Major 513.
 1415 III.—H. E. MITCHELL, Great Pellingbridge Farm, Scaynes Hill, Haywards Heath, for Woodcock Gipsy 4883, born April 22, 1929, calved April 7, 1932, bred by R. F. Walker, East Grinstead; s. O.P.H. Glenstone Derby 729, d. O.P.H. Gipsy Drop 8648 by O.P.H. Sheen Mohr Blarney 447.
 1413 R.N.—W. MCA. HOUSTOUN, Sachel Court, Alfold, Billingshurst, for Sachel Molly.

¹ The "Conyngnam" Perpetual Silver Challenge Cup given through the English Jersey Cattle Society for the most points awarded in a combination of entries.

² Silver Challenge Cup given by the British Kerry Cattle Society for the best Kerry.

Dexters.

N.B.—In the Dexter Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Royal Dublin Society's Herd Book. A number without brackets indicates that the animal is registered in the English Dexter Herd Book.

Class 199.—Dexter Bulls, born in or before 1930.

- 1418 I.—Champion,¹ & Champion.²—MRS. ERNEST JOHNSON, Ashton Hayes, Chester, for Grinstead Taxi 1089, born Aug. 6, 1929, bred by Lady Loder, Leonardslee, Horsham; s. Oakridge Evergood 2nd 1014, d. Grinstead Taxus 2nd 3680 by Cobham Clinker 826.
 1422 II.—R.N. for Champion,¹ & R.N. for Champion.²—MAJOR R. JOHNSTONE STIRLING, Pympe Manor, Benenden, Kent, for Benenden Buttonhole 1103, born June 6, 1929; s. Barrow Donald 996, d. Nosegay of Exmoor 4215 by Haverling Bob Orange 885.
 1417 III.—MRS. C. M. L. CALVERT, Banwell Castle, Banwell, Somerset, for Banwell Peter 1081, born July 1, 1929; s. Banwell Breeze 898, d. Banwell Pansy 3914 by Banwell Brat 814.
 1419 R.N.—LADY LODER, Leonardslee, Horsham, for Braxted Punch.
 H.C.—1420, 1421.

Class 200.—Dexter Bulls, born in 1931.

- 1427 I.—LADY LODER, Leonardslee, Horsham, for Grinstead Smiling Fellow, born Aug. 21; s. Pulham Smile 1054, d. Grinstead Fuchsia 2nd 8974 by Grinstead Fred 926.
 1428 II.—MRS. RICHARD MAGOR, Springfield Lyons, Chelmsford, for Lyons Red Berry 1117, born April 26; s. Grinstead Cranberry 1041, d. Lyons Red Lady 8888 by Bertie of Grinstead 785.
 1429 III.—MRS. T. H. PEYTON, Colomendy, Mold, North Wales, for Colomendy Symon, born Nov. 1; s. Oakridge Simple Simon 1072, d. Thorpe Lily 4240 by Alvechurch Beauty 809.
 1425 R.N.—THOMAS A. EMMET, Amberley Castle, Sussex, for Grinstead Smiling Hawker.
 H.C.—1428, 1430. C.—1424.

Class 201.—Dexter Cows, in-milk, born in or before 1928.

- 1438 I.—LADY LODER, Leonardslee, Horsham, for Grinstead Tropaeolum 2nd 3813, born Aug. 23, 1926, calved May 20, 1932; s. Grinstead Fred 926, d. Grinstead Tropaeolum 3469 by Brokenhurst Penny 2nd 694.
 1436 II.—MRS. ERNEST JOHNSON, Ashton Hayes, Chester, for Grinstead Convulvulus 3458, born Nov. 29, 1928, calved June 20, 1932, bred by Lady Loder, Leonardslee, Horsham; s. Brokenhurst Penny 2nd 694, d. Grinstead Carp 2501 by Brokenhurst Spalpeen 558.
 1442 III.—MRS. T. H. PEYTON, Colomendy, Mold, North Wales, for Gaynes Gay 3800, born March 14, 1925, calved April 11, 1932, bred by the Hon. Gerald Wellesley and the Hon. Mrs. Duherley, Gaynes Hall, Huntingdon; s. Cobham Blacksmith 727, d. La Manchia Liz 2357 F.S.
 1437 R.N.—LADY LODER, for Grinstead Nightingale 3rd.
 H.C.—1431, 1438, 1441. C.—1432.

Class 202.—Dexter Heifers, in-milk to first calving, born in 1929 or 1930.

- 1444 I.—LADY LODER, Leonardslee, Horsham, for Grinstead Convulvulus 4th 4305, born March 31, 1930, calved June 8, 1932; s. Oakridge Evergood 2nd 1014, d. Grinstead Convulvulus 3458 by Brokenhurst Penny 2nd 694.
 1443 II.—MRS. C. M. L. CALVERT, Banwell Castle, Banwell, Somerset, for Gotton Lady's Maid, born June 17, 1930, calved June 18, 1932, bred by Capt. Clode Braddon, Gotton, Cheddon Fitzpaine, Taunton; s. Gotton Peter Pan 1040, d. Gotton Ladylike 8804 by King Charles of Exmoor 748.
 1446 III.—MAJOR R. JOHNSTONE STIRLING, Pympe Manor, Benenden, Kent, for Benenden Butterfly 3rd, born July 12, 1929, calved April 4, 1932; s. Wells Piper's Son 1056, d. Benenden Butterfly 4072 by Grinstead Dainty Jock 925.
 1445 R.N.—MRS. HUMPHREY R. FELLY, Lyndsays Farm, Ingatestone, Essex, for Lyndsays Titania.

Milk Yield Classes.

Class 203.—Dairy Shorthorn Cows or Heifers.

- 787 I.—J. PIERPONT MORGAN, Wall Hall, Watford, for 100022 Aldenham Kirklevington Lady 3rd, red, born June 15, 1927, calved June 4, 1932; s. Aldenham Kirklevington Duke 2nd 204357, d. 77844 Aldenham Kirklevington Lady by Cotlands Waterloo Duke 6th 155058.

¹ Silver Challenge Cup given by the Dexter Cattle Society for the best Dexter.

² Silver Challenge Breeders' Bowl given through the Dexter Cattle Society for the best animal already registered in the Dexter Herd Book, and which is the progeny of sire and dam already registered.

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- 793 II.—CAPT. ARNOLD S. WILLS, Thornby Hall, Northampton, for 103820 Thornby Foggathorpe 30th, white, born June 16, 1927, calved June 8, 1932; s. Thornby Royal Cran 185653, d. Thornby Foggathorpe 2nd by Dreadnought 102049.
779 III.—JOHN CROWE, for Cheston Rosette. (See Class 186.)

Class 204.—Lincolnshire Red Shorthorn Cows or Heifers.

- 846 I.—FRANK SAINSBURY, for Soothern Charm. (See Class 142.)
844 II.—JOHN EVENS & SON, for Burton Jewess 5th. (See Class 142.)
839 III.—JOHN EVENS & SON, for Broxholme Recorder (vol. 29, p. 508), born May 21, 1922, calved May 19, 1932, bred by H. Sutton, Broxholme, Lincoln; s. Burton Tingle 14318, d. Retford Recorder 2nd by Burton Grove 14307.
845 R.N.—JOHN EVENS & SON, for Burton Ruby Spot 23rd.
H.C.—850.

Class 205.—South Devon Cows or Heifers.

- 875 I.—J. T. DENNIS, Winsor Farm, Yealmpton, Devon, for Snowdrop 2nd 19869, born Dec. 19, 1918, calved March 19, 1932, bred by F. Hocking, Hardwick, Plympton; s. Hardwick 2nd 5958, d. Buttercup 9875.
873 II.—DARTINGTON HALL, LTD., The Barton Farm, Dartington Barton, Totnes, for Milkmaid 33rd 82403, born Feb. 10, 1926, calved March 12, 1932, bred by W. S. Harris, Aish House, Stoke Gabriel; s. Mothecombe Sunbeam 9915, d. Milkmaid 16th 23112.
876 III.—MISS JERVOISE SMITH, for Dittisham Nina 2nd. (See Class 148.)
874 R.N.—DARTINGTON HALL, LTD., for Myrtle.
H.C.—871, 872.

Class 206.—Red Poll Cows or Heifers.

- 924 I.—LORD CRANWORTH, for Grundisburgh Wanderer. (See Class 154.)

Class 207.—Blue Albion Cows or Heifers.

(No Award.)

Class 208.—British Friesian Cows or Heifers.

- 1044 I.—E. G. BARTON, Saundby, Retford, Notts., for Chaddesley Hedge Rose 2nd 69470, born April 16, 1923, calved June 18, 1932, bred by J. H. Bean, Chaddesley Corbett, Kidderminster; s. Chaddesley Comrade 18497, d. Chaddesley Hedge Rose 43954 by Glenanne Pioneer 7923.
1056 II.—STRUTT & PARKER (FARMS), LTD., The Bury, Hatfield Peverel, Chelmsford, for Lavenham Chancery 3rd 95606, born Aug. 12, 1925, calved May 27, 1932; s. Lavenham Black Boy 20719, d. Lavenham Chancery 2nd 63518 by Terling Chief 15475.
1061 III.—A. J. CREED, for Hawthorn Katja. (See Class 171.)
1055 IV.—STRUTT & PARKER (FARMS), LTD., for Lavenham Annie 13th 84184, born Aug. 1, 1924, calved June 5, 1932; s. Terling Chief 15475, d. Lavenham Annie 7th 63506 by Terling Taurus 12818.
1057 R.N.—STRUTT & PARKER (FARMS), LTD., for Lavenham Jess 2nd.
H.C.—1053.

Class 209.—Ayrshire Cows or Heifers.

- 1150 I.—DAVID SMITH, Kilmaurs Mains, Kilmarnock, for Hillowton Lavender 4238, born Jan. 2, 1925, calved June 7, 1932, bred by David McGill, Hillowton, Castle Douglas; s. Caigton Royalist 21152, d. Hillowton Ethel 4th 84606 by Hillowton Sunshine 19277.
1145 II.—F. H. SANDERSON, for Anchenbrain Miss Uraig 84th. (See Class 178a.)
1148 III.—ROBERT SILLARS & SON, Ickham Court, Canterbury, for Ickham Carol 10682, born May 18, 1926, calved June 2, 1932; s. Westburn Cupbearer 22197, d. Netherton Carol 8rd A7815 by Netherton Dayspring 13814.
1162 R.N.—ALEXANDER D. MURCHIE, Bogside, Droghda, Ayrshire, for Bogside Butter Fat.
H.C.—1132, 1136, 1137, 1138.

Class 210.—Guernsey Cows or Heifers.

- 1237 I.—MRS. JERVOISE, for Harriard Sweet 4th. (See Class 184.)
1235 II.—J. H. V. COLLINGS, The Guernsey Dairy, Middleton, Bognor Regis, for 27368 Tregonning Polly 10th, fawn and white, born Nov. 7, 1927, calved April 28, 1932, bred by G. Blight, Tregonning, Helston, Cornwall; s. Tregenna May Bird 4961, d. 18411 Tregonning Polly 5th by Puddington Toreador 4296.
1258 III.—R. M. THORNELY, Elm Grove, Kingsclere, Newbury, for 23218 Elm Grove Daffodil, dark fawn and white, born April 19, 1928, calved March 28, 1932; s. Ruspur Lord Roberts 2nd 6024, d. 16397 Donnington Jubilee 18th by Donnington Noble 20th 3897.
1250 IV.—CAPT. COSMO DOUGLAS, for Hazelby Sunshine. (See Class 185.)
1243 R.N.—CAPT. A. HAROLD STOCKER, North Lands, Chichester, for Whitebury Viola.
H.C.—1244, 1255, 1257.

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Class 211.—Jersey Cows or Heifers.

- 1827 I.—GROSVENOR BERRY, Mount Bures, Bures, Suffolk, for Black Art's Postgirl 10470, whole colour, born March 20, 1928, calved April 1, 1932; s. Black Art 15590, d. Postgirl 2nd 6968 by Nimrod 14890.
 1854 II.—E. A. STRAUSS, M.P., Kingston House, Abingdon, for Tokay's Tassel 7200, whole colour, born June 12, 1925, calved May 16, 1932, bred by Dr. H. Watney, Buckhold, Pangbourne; s. Tokay 15128, d. Tassel 4144 by Gauntlet's Majesty 18270.
 1828 III.—GROSVENOR BERRY, for March Dinah 11255, whole colour, born March 21, 1928, calved March 9, 1932; s. Black Art 15590, d. Winter Dinah 7297 by Nimrod 14890.
 1847 IV.—H. CECIL PELLY, for Flashlight's Josy. (See Class 191.)
 1834 V.—MRS. EVELYN, for War Planet. (See Class 191.)
 1836 R.N.—MISS HORDERN, Cobham Court, Bekebourne, Canterbury, for Fireball. H.C.—1887, 1842, 1848, 1853, 1876.

Class 212.—Kerry Cows or Heifers.

- 1409 I. & Champion.¹—H. E. MITCHELL, for Ard Caein Dove. (See Class 197.)
 1404 II. & R.N. for Champion.¹—MISS H. K. A. GOSSLING, for Chaselbourne Fan. (See Class 197.)
 1411 III.—NEWTON R. STEEL, for Muckcross Moscow. (See Class 197.)

Class 213.—Dexter Cows or Heifers.

- 1437 I. & Champion.¹—LADY LODER, Leonardslee, Horsham, for Grinstead Nightingale 3rd 8626, born Dec. 19, 1925, calved April 29, 1932; s. Brokenheart Penny 2nd 694, d. Grinstead Nightingale 3810 by Cobham Caruso 729.
 1438 II. & R.N. for Champion.¹—A. J. CREED, Goldicote House, Stratford-on-Avon, for Wightwick Dolly 2nd 4042, born June 1, 1924, calved March 31, 1932, bred by Miss Dora Box, Lower Farm, Darlingscote, Shipston-on-Stour; s. Wightwick Prince 899, d. Wightwick Dolly 3205 by Oakridge Pat 673.
 1442 III.—MRS. T. H. PEYTON, for Gaynes Gay. (See Class 201.)
 1441 R.N.—MRS. T. H. PEYTON, for Colomandy Mary.

Butter Tests.

Class 214a.—Cows exceeding 900 lb. live weight.

- 1061 I.—A. J. CREED, for Hawthorn Katja. (See Class 171.)
 875 II.—J. T. DENNIS, Winsor Farm, Yealmpton, Devon, for Snowdrop 2nd 19869, born Dec. 19, 1918, calved March 19, 1932, bred by F. Hoeking, Hardwick, Plympton; s. Hardwick 2nd 8958, d. Buttercup 8375.
 1845 III. & G.M.²—H. S. MOUNTAIN, Groombridge Place, Groombridge, Kent, for Sir Laurel's Berthe 8554, broken colour, born July 26, 1926, calved Jan. 7, 1932; s. Sir Laurel 15228, d. Xenia's Berthe 2795 by Xenia's Sultan 18798.
 793 IV.—CAPT. ARNOLD S. WILLS, Thornby Hall, Northampton, for 108820 Thornby Foggathorpe 30th, white, born June 18, 1927, calved June 3, 1932; s. Thornby Royal Cran 185653, d. Thornby Foggathorpe 2nd by Dreadnought 102049.
 1150 V.—DAVID SMITH, Kilmaurs Mains, Kilmarnock, for Hillowton Lavender 4233, born Jan. 2, 1925, calved June 7, 1932, bred by David McHill, Hillowton, Castle Douglas; s. Caigton Royalist 21152, d. Hillowton Ethel 4th 84606 by Hillowton Sunshine 19277.
 874 R.N.—DARTINGTON HALL, LTD., for Myrtle. (See Class 143.)

Class 214b.—Cows not exceeding 900 lb. live weight.

- 1847 I. & S.M.³—H. CECIL PELLY, for Flashlight's Josy. (See Class 191.)
 1848 II. & B.M.⁴—MRS. C. J. PHILLIPS, Old Dalby Hall, Melton Mowbray, for Dalby Reigning Star 9099, whole colour, born Oct. 28, 1928, calved April 1, 1932, bred by the late C. J. Phillips; s. Gloxalia's Georgius Rex 15988, d. Dalby Stella Maris 7879 by Culverden Pioneer's Oyster 14852.
 1837 III.—CAPT. E. L. HUGHES, R.N., Spring Hill, Capel, Ipswich, for Princess Peggy, whole colour, born Oct. 24, 1928, calved March 28, 1932; s. Kentwins Yellow Prince 16310, d. Peggy 5th (vol. 31, p. 866), by Goddington Noble 16th 12819.
 1842 R.N.—GORDON MCWILLIAM, Dunwood Manor Farm, Romsey, Hants., for Bollhayes May's Sunrise.
 Certificates of Merit.⁴—1827, 1828, 1830, 1832, 1834, 1842, 1853, 1854.

¹ The "Elmhurst" Perpetual Silver Challenge Cup given by the British Kerry Cattle Society for the Kerry Cow gaining the highest number of points.

² Perpetual Silver Challenge Cup given by the Dexter Cattle Society for the Dexter Cow gaining the highest number of points.

³ Gold Medal (or £10 in money), Silver Medal and Bronze Medal given by the English Jersey Cattle Society for the three Jersey Cows obtaining the greatest number of points in the Butter Tests.

⁴ Certificates of Merit given by the English Jersey Cattle Society for Jersey Cows, not being Prize Winners, obtaining the following points: Cows four years old and under 80; Cows over four years old, 85.

GOATS.¹

The Prizes in each Class for Goats are: First Prize, £5; Second Prize, £3; Third Prize, £2; Fourth Prize, £1; Fifth Prize, 10s.

Class 215.—Toggenburg or British Toggenburg Female Goats, in-milk, any age.

- 1447 I. & Champion.²—Miss MARY BURGESS, Olivers Stray, Sutton Grange, Ripon, for Murraystone Clyde 678, Toggenburg, born Feb. 15, 1929, kidded April 20, 1932; s. Leazes Prince Hal 643, d. Riding Clytie 548 by Leazes Benjamin 482.
 1455 II. & R.N. for Champion.³—Miss M. WINDOW HARRISON, Yewtree Poultry Farm, North Weald, Essex, for Nesta of Weald 692, Toggenburg, born Feb. 23, 1930, kidded Feb. 17, 1932; s. Fryston Sprig 620, d. Sandhill Nerine 574 by Carpenter 528.
 1449 III.—Miss MARY BURGESS, for Murrayston Clyna 696, Toggenburg, born March 1, 1930, kidded March 7, 1932; s. Murrayston Buchan 632, d. Riding Clytie 548 by Leazes Benjamin 482.
 1451 IV. & Champion.⁴—Miss BRUCE FARRER, The Grange, Kenninghall, Norwich, for Hargrave Saintomer 487, British Toggenburg, born May 18, 1929, kidded Feb. 17, 1932; s. Fryston Sprig 620, d. Marye 472 by Parham.
 1454 R.N.—Miss GRESLEY HALL, Chestnut Tree House, Willersey, Broadway, Worcs., for Webb Diana.
 H.C.—1450. C.—1457.

Class 216.—Saanen or British Saanen Female Goats, in-milk, any age.

- 1472 I., Champion.⁴ Champion.⁵ & Champion.⁶—Miss V. WALTON, Hawthorn Cottage, East Ashling, Chichester, for Feltham Fairy 9346, British Saanen; born Feb. 21, 1929, kidded May 7, 1932, bred by Mrs. Browell, Ringlets, Battle; s. Playwright of Bashley 114, d. Distrain 7989.
 1461 II., R.N. for Champion.⁴ R.N. for Champion.⁵ & R.N. for Champion.⁶—J. R. EGERTON, Malpas Cottage, Rushmere, Ipswich, for Worlington Waverly 138, British Saanen, born Feb. 25, 1929, kidded April 17, 1931, bred by Mrs. Clayton Swan, Poulton Grange, Cirencester; s. Springfield Fortuity 88, d. Ridgeway Ringlet 8124 by Ridgeway Rip Van Winkle 87.
 1466 III.—Miss EMILY SKIDMORE, Ashley Leigh, Box, Wilts., for Heddon Shake 9014, British Saanen, born Feb. 28, 1929, kidded Feb. 24, 1932; s. Heddon Solan 8322, d. Heddon Silvo 7452 by Schnapps 82.
 1464 IV.—Miss FORT, Bashley Lodge, New Milton, Hants., for Mostyn Mandoline 9040, British Saanen, born Jan. 15, 1929, kidded Feb. 29, 1932, bred by Miss Mostyn Owen, Huntington, York; s. Didgemere Aristocrat 8207, d. Mostyn Music 8058 by Didgemere Robert 7718.
 1459 V.—J. R. EGERTON, for Malpas Mermaid 218, British Saanen, born March 9, 1930, kidded March 7, 1932; Heddon Solan 106, d. Theydon Perfection 45 by Ridgeway Rumpelstiltskin 6386.
 1465 R.N. & Champion.⁷—Miss EMILY SKIDMORE, for Broxbourne Barbara 100, Saanen, born March 7, 1927, kidded March 5, 1932, bred by H. E. Hughes, Lane Street, Perth, W. Australia; s. Broxbourne Gold 62, d. Broxbourne Jane 91.
 H.C.—1462. C.—1469.

Class 217.—Anglo-Nubian Female Goats, in-milk, any age.

- 1477 I. & Champion.⁸—Miss K. PELLY, Theydon Place, Epping, for Theydon Belle 2019, born March 16, 1930, kidded Feb. 5, 1932; s. Theydon Bertrano 1725, d. Theydon Belle 1909 by Ramhurst Corker 1799.
 1475 II. & R.N. for Champion.⁸—Miss K. PELLY, for Juliette of Cottishall 2068, born May 5, 1930, kidded Feb. 13, 1932, bred by Mrs. Howden, Cottishall, Norfolk; s. Theydon Bertrano 1725, d. Ramhurst Judy 1828 by Wells Plutus 1729.
 1479 III.—Mrs. REED-SMITH, Ashley Leigh, Box, Wilts., for Barbetta 1962, born Dec. 25, 1928, kidded March 13, 1932; s. Etherley Corrie 1925, d. Theydon Bettina 1532.
 1478 R.N.—Miss K. PELLY, for Theydon Bride.

¹ £20 towards these prizes were given by the British Goat Society, and all the Challenge Certificates and Medals enumerated below.

² Breed Challenge Certificate for the best Toggenburg Female Goat, over 2 years old.

³ Breed Challenge Certificate for the best British Toggenburg Female Goat, over 2 years old.

⁴ Breed Challenge Certificate for the best British Saanen Female Goat, over 2 years old.

⁵ Challenge Certificate for the best Female Goat over 2 years old that has borne a kid.

⁶ Bronze Medal for the best Female Goat.

⁷ Challenge Certificate for the best Saanen Female Goat over 2 years old.

⁸ Breed Challenge Certificate for the best Anglo-Nubian Female Goat, over 2 years old.

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Class 218.—British Alpine Female Goats, in-milk, any age.

- 1480 I. & Champion.¹—Miss C. CHAMBERLAIN, Westons, Lyndhurst, Hants., for Whimsy of Westons 9012, born Feb. 23, 1929, kidded April 12, 1932; s. Didgemere Angus 7161, d. Whimsical of Westons 7051 by Didgemere Dictator 6816.
1482 II. & R.N. for Champion.¹—Miss C. CHAMBERLAIN, for Whin of Westons 9734, born May 8, 1930, kidded April 21, 1932; s. Didgemere Angus 7161, d. Whimsical of Westons 7051 by Didgemere Dictator 6816.

Class 219.—Female Goats, in-milk, any age, any other variety.

- 1486 I.—Miss C. CHAMBERLAIN, Westons, Lyndhurst, Hants., for Wavelet of Westons 9377, British, born June 21, 1929, kidded April 3, 1932; s. Springfield Count 8514, d. Worthy of Westons 7969 by Poet of Bashley 7457.
1487 II.—Miss GRESLEY HALL, Chestnut Tree House, Willersey, Broadway, Worcs., for Webb Donna 9564, British, born March 15, 1930, kidded Feb. 22, 1932; s. Pytchley Crispin 8668, d. Webb Diana 7657 by Carpentier 528.
1488 III.—Mrs. BROWELL, Ringletts Farm, Battle, Sussex, for Proof of Bashley 8487, Anglo-Nubian-Swiss, born Jan. 31, 1928, kidded March 1, 1932, bred by Miss Pope, Bashley Lodge, New Milton; s. Feltham Asterus 8117, d. Problem of Bashley 8076 by Proud 2853.
1488 R.N.—Miss ALEXANDER, Byards Lodge, Knaresborough, for Stockwell Tsarina.

Class 220.—Toggenburg, British Toggenburg, Saanen or British Saanen Goatslings, over 1 but not exceeding 2 years old.

- 1497 I & Champion.¹—Miss EMILY SKIDMORE, Ashley Leigh, Box, Wilts., for Heddon Selina 275, British Saanen, born March 12, 1931; s. Springfield Luke 121, d. Heddon Spring 9 by Broxbourne Gold 62.
1498 II.—Miss V. WALTON, Hawthorn Cottage, East Ashling, Chichester, for Dissington Marcella 10222, British Saanen, born April 24, 1931, bred by Mrs. Rotherford, The Pines, Throckley, Newcastle-on-Tyne; s. Ridgeway Runli 8711, d. Dissington Marvella 9274.
1498 III.—Miss K. PELLY, Theydon Place, Epping, Essex, for Theydon Periwinkle 10374, British Saanen, born March 29, 1931; s. Ridgeway Ripper 194, d. Theydon Pauline 8509 by Ridgeway Rodrigo 8126.
1498 IV.—Miss C. CHAMBERLAIN, Westons, Lyndhurst, Hants., for Didgemere Boadicea 10416, British Saanen, born Feb. 7, 1931, bred by Mrs. Arthur Abbey, Graveleys, Gt. Waltham, Essex; s. Warrior of Westons 9011, d. Didgemere Dismay 8979.
1490 R.N.—J. R. EGERTON, Malpas Cottage, Rushmere, Ipswich, for Malpas Mimi. H.C.—1488, 1493. C.—1491.

Class 221.—Anglo-Nubian Goatslings, over 1 but not exceeding 2 years old.

- 1501 I.—Miss K. PELLY, Theydon Place, Epping, Essex, for Hoveton Francoa 2072, born Jan. 8, 1931, bred by Dr. B. D. Z. Wright, Hoveton St. John, Norfolk; s. Hoveton Borage 1930, d. Hoveton Fritillary 1619 by Nash Rufus 1450.
1502 II.—Miss K. PELLY, for Theydon Barbara 2129, born Feb. 12, 1931; s. Hoveton Freckle 1873, d. Theydon Barbarette 1802 by Herne Bay President 1553.
1500 III.—J. R. EGERTON, Malpas Cottage, Rushmere, Ipswich, for Hoveton Frivolity 2074, born Feb. 5, 1931, bred by Dr. B. D. Z. Wright, Hoveton St. John, Norfolk; s. Hoveton Borage 1930, d. Hoveton Fenberry 1931 by Theydon Bertrano 1725.
1499 R.N.—J. R. EGERTON, for Hoveton Frailty.

Class 222.—Goatslings, any other variety, over 1 but not exceeding 2 years old.

- 1506 I. & R.N. for Champion.¹—Miss V. WALTON, Hawthorn Cottage, East Ashling, Chichester, for Bittern Fennella 10129, British Saanen, born Feb. 28, 1931, bred by Miss K. A. Barnaby, Abbey Meade, Hamble, Hants.; s. Feltham Frolic 9640, d. Pensive of Bashley 7589.
1505 II.—Miss POPE, Bashley Lodge, New Milton, Hants., for Pipe of Bashley 10020, British, born March 7, 1931; s. Springfield Court 8514, d. Mostyn Mandoline 9040 by Didgemere Aristocrat 8207.
1504 III.—J. R. EGERTON, Malpas Cottage, Rushmere, Ipswich, for Malpas Magna 10285, British, born April 17, 1931; s. Springfield Luke 121, d. Worlington Wavey 188 by Springfield Fortuity 88.

¹ Breed Challenge Certificate for the best British Alpine Female Goat, over 2 years old.

² Bronze Medal for the best Goatsling.

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Class 223.—Female Kids, any variety, not over 1 year old.

- 1508 I.—Miss C. CHAMBERLAIN, Westons, Lyndhurst, Hants., for Wonbywait of Westons 10550, British, born April 8, 1932; s. Raydon Nougat 10184, d. Wavelet of Westons 9877 by Springfield Count 8514.
1519 II.—Miss EMILY SKIDMORE, Ashley Leigh, Box, Wilts., for Heddon Buttercup, Saanen, born March 5, 1932; s. Springfield Luke 121, d. Broxbourne Barbara 100 by Broxbourne Gold 62.
1514 III.—Miss BRUCE FARRER, The Grange, Kenninghall, Norwich, for Hargrave Foxtro 10472, British Saanen, born Jan. 13, 1932; s. Didgemere Aristocrat 105, d. Danecroft Dancer 181 by Playwright of Bashley 114.
1521 IV.—Miss EMILY SKIDMORE, for Heddon Butterfly, Saanen, born March 5, 1932; s. Springfield Luke 121, d. Broxbourne Barbara 100 by Broxbourne Gold 62.
1509 V.—Miss C. CHAMBERLAIN, for Worthwhile of Westons 10551, British, born April 8, 1932; s. Raydon Nougat 10184, d. Wavelet of Westons 9877 by Springfield Count 8514.
1518 R.N.—Miss GRESLEY HALL, Chestnut Tree House, Willersey, Broadway, Worcs., for Webb Diony.
H.C.—1515. C.—1511, 1516.

Milk Yield Classes.

Class 224.—Milk Yield Class, Quality, open to animals entered in Classes 215 to 219.

- 1485 I.—Mrs. BROWELL, for Proof of Bashley. (See Class 219.)
1486 II. & R.N. for Champion.—Miss C. CHAMBERLAIN, for Wavelet of Westons. (See Class 219.)
1480 III, Champion,¹ & Champion¹ & (with 1489) R.N. for Champion.—Miss C. CHAMBERLAIN, for Whimsy of Westons. (See Class 218.)
1407 IV.—Miss E. SKIDMORE, Ashley Leigh, Box, Wilts., for Heddon Shoe 10281, British Saanen, born April 18, 1930, kidded April 6, 1932; s. Springfield Luke 121, d. Heddon Saltcellar 7446 by Peter of Bashley 4207.
1461 V. & (with 1504) Champion.¹—J. R. EGERTON, for Worlington Wavy. (See Class 216.)
1482 R.N. & R.N. for Champion.¹—Miss C. CHAMBERLAIN, for Whin of Westons. (See Class 218.)
H.C.—1489, 1462, 1463, 1464, 1465, 1472, 1483.

Class 225.—Milk Yield Class, Quantity, open to animals entered in Classes 215 to 219.

- 1486 I.—Miss C. CHAMBERLAIN, for Wavelet of Westons. (See Class 219.)
1461 II.—J. R. EGERTON, for Worlington Wavy. (See Class 216.)
1485 III.—Mrs. BROWELL, for Proof of Bashley. (See Class 219.)
1480 IV.—Miss C. CHAMBERLAIN, for Whimsy of Westons. (See Class 218.)
1464 V.—Miss POPE, for Mostyn Mandoline. (See Class 216.)
1468 R.N.—Miss K. PELLY, Theydon Place, Epping, for Theydon Perronelle.
H.C.—1489, 1467, 1472, 1483.
1469 Cup.—J. R. EGERTON, for Malpas Mermaid.
1466 R.N. for Cup.—Miss EMILY SKIDMORE, for Heddon Shake.
1475 Cup.—Miss K. PELLY, for Juliette of Cotishall.
1477 R.N. for Cup.—Miss K. PELLY, for Theydon Belle.

¹ Challenge Certificate for the best Dual Purpose Goat, over 2 years old, that has borne a kid.

² The "Abbey" Challenge Cup given through the British Goat Society for the British Alpine Goat gaining the highest number of points in Inspection and Milking. The goat must be bred by exhibitor, entered in the British Alpine section of the Herd Book, and have obtained an award in the Inspection Class.

³ The "Dewar" Challenge Cup given through the British Goat Society for the exhibitor showing a Female Goat in-milk, and a Goatling, under certain conditions.

⁴ The "Chamberlain" Challenge Cup for the Saanen or British Saanen Goat gaining the highest number of points in Inspection and Milking. The goat must be bred by exhibitor, entered in the Saanen or British Saanen section of the Herd Book, and have obtained an award in the Inspection Class.

⁵ The "Pomeroy" Challenge Cup for the Anglo-Nubian Goat, entered in the Anglo-Nubian section of the British Goat Society's Herd Book, gaining the highest number of points in the Milking Classes.

SHEEP.

Unless otherwise stated, the Prizes in each Class for Sheep are: First Prize, £10; Second Prize, £5; Third Prize, £3; Fourth Prize, £2; Fifth Prize, £1.

Oxford Downs.

Class 226.—*Oxford Down Shearling Rams.*

- 1524 I., Champion,¹ & R.N. for Champion,² 1526 IV., & 1528 R.N.—H. W. STILGOE, The Grounds, Adderbury, Banbury.
1533 II.—G. H. WILLIS, Birdlip, Glos.
1522 III.—E. G. CLIFFORD, Mauley Farm, Quenington, Fairford, Glos.
1530 V.—S. C. WAKEFIELD, Langford Downs, Lechlade, bred by T. Rich & Son, Aldsworth, Northleach.

Class 227.—*Oxford Down Ram Lambs.*

- 1535 I. & R.N. for Champion.³—LAWRENCE B. AKERS, Litchfield Farm, Enstone, Oxford.
1542 II.—W. F. G. WATTS, Elsfield, Oxford.
1540 III., and 1539 IV.—H. W. STILGOE, The Grounds, Adderbury, Banbury.
1541 R.N.—S. C. WAKEFIELD, Langford Downs, Lechlade.
H.C.—1543.

Class 228.—*Three Oxford Down Ram Lambs.*

- 1551 I.—W. F. G. WATTS, Elsfield, Oxford.
1545 II.—LAWRENCE B. AKERS, Litchfield Farm, Enstone, Oxford.
1548 III.—HOBBS & DAVIS, Kelmescott, Lechlade.
1549 IV.—H. W. STILGOE, The Grounds, Adderbury, Banbury.
1544 R.N.—R. G. ADAMS, Fernham Manor, Faringdon.
H.C.—1550.

Class 229.—*Three Oxford Down Shearling Ewes.*

- 1555 I. & R.N. for Champion.⁴—W. F. G. WATTS, Elsfield, Oxford.
1554 II.—H. W. STILGOE, The Grounds, Adderbury, Banbury.
1556 III.—G. H. WILLIS, Birdlip, Glos.
1553 R.N.—E. G. CLIFFORD, Mauley Farm, Quenington, Fairford, Glos.

Class 230.—*Three Oxford Down Ewe Lambs.*

- 1561 I., Champion,⁵ & Champion.⁶—HOBBS & DAVIS, Kelmescott, Lechlade.
1563 II.—W. F. G. WATTS, Elsfield, Oxford.
1567 III.—R. G. ADAMS, Fernham Manor, Faringdon.
1562 R.N.—H. W. STILGOE, The Grounds, Adderbury, Banbury.
H.C.—1558.

Shropshires.

Class 231.—*Shropshire Shearling Rams.*

- 1566 I., Champion,⁴ & R.N. for Champion.⁵—WILLIAM EVERALL, Shrawardine Castle Shrewsbury.
1568 II. & R.N. for Champion,⁴ and 1567 III.—N. J. NUNNERLEY, Ternhill House, Market Drayton.
1565 R.N.—MRS. F. BRIAN BIBBY, Sansaw, Shrewsbury.
H.C.—1569, 1570.

¹ The "Chalfield" Silver Challenge Cup given through the Oxford Down Sheep Breeders' Association for the best Male exhibit.

² The "Northwick" Silver Challenge Cup given through the Oxford Down Sheep Breeders' Association for the best exhibit.

³ The "Broadwell" Silver Challenge Plate given through the Oxford Down Sheep Breeders' Association for the best Female exhibit.

⁴ Champion Silver Medal given by the Shropshire Sheep Breeders' Association for the best Ram or Ram Lamb in Classes 231 and 232.

⁵ The "Hardwicke" Perpetual Silver Challenge Cup, given through the Shropshire Sheep Breeders' Association, for the best exhibit.

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Class 232.—Shropshire Ram Lambs.

- 1574 I.—MAJOR J. N. RITCHIE, Tern, Wellington, Shropshire.
1572 II.—N. J. NUNNERLEY, Ternhill House, Market Drayton.
1571 III.—WILLIAM EVERALL, Shrawardine Castle, Shrewsbury.
1576 R.N.—J. G. W. TILL, Kemerton Court, Tewkesbury.

Class 233.—Three Shropshire Shearling Rams.¹

- 1578 I.—MRS. F. BRIAN BIBBY, Sansaw, Shrewsbury.
1580 II.—N. J. NUNNERLEY, Ternhill House, Market Drayton.
1582 III.—E. CRAIG TANNER, Eytton-on-Severn, Wroxeter, Shrewsbury.
1579 R.N.—WILLIAM EVERALL, Shrawardine Castle, Shrewsbury.
H.C.—1581.

Class 234.—Three Shropshire Ram Lambs.

- 1583 I.—WILLIAM EVERALL, Shrawardine Castle, Shrewsbury.
1585 II.—MAJOR J. N. RITCHIE, Tern, Wellington, Shropshire.
1584 III.—N. J. NUNNERLEY, Ternhill House, Market Drayton.
1586 R.N.—E. CRAIG TANNER, Eytton-on-Severn, Wroxeter, Shrewsbury.
C.—1587.

Class 235.—Three Shropshire Shearling Ewes.

- 1588 I. & Champion,² and 1590 II.—MRS. F. BRIAN BIBBY, Sansaw, Shrewsbury.

Class 236.—Three Shropshire Ewe Lambs.

- 1592 I.—N. J. NUNNERLEY, Ternhill House, Market Drayton.
1591 II.—WILLIAM EVERALL, Shrawardine Castle, Shrewsbury.
1593 III.—MAJOR J. N. RITCHIE, Tern, Wellington, Shropshire.
1594 R.N.—J. G. W. TILL, Kemerton Court, Tewkesbury.

Southdowns.

Class 237.—Southdown Two Shear Rams.

- 1597 I. & R.N. for Champion,³ & R.N. for Champion.—SIR JEREMIAH COLMAN, BART., Gatton Park, Surrey, for Gatton Park H. 186 20584.
1596 II.—SIR JEREMIAH COLMAN, BART., for Gatton Park H. 175 20588.
1595 III.—SIR JEREMIAH COLMAN, BART., for Gatton Park H. 142 20577.
1603 IV.—J. PIERPONT MORGAN, Wall Hall, Watford, for Aldenham 656 of 1930.
1601 R.N.—LADY LUDLOW, Luton Hoo, Luton, for Luton Hoo 274 of 1930.
H.C.—1598, 1600. C.—1602, 1606.

Class 238.—Southdown Shearling Rams.

- 1614 I. and 1615 III.—LADY LUDLOW, Luton Hoo, Luton.
1612 II.—JOHN LANGMEAD & SONS, Northwood, Ford, Arundel.
1608 IV.—SIR JEREMIAH COLMAN, BART., Gatton Park, Surrey.
1621 V.—MRS. V. G. STRIDE, Head Hone Estate, Lidsey, Bognor Regis.
1618 R.N.—J. PIERPONT MORGAN, Wall Hall, Watford.
H.C.—1607, 1611. C.—1609, 1619, 1622.

Class 239.—Southdown Ram Lambs.⁴

- 1631 I. & Champion,⁵ & Champion.—JOHN LANGMEAD & SONS, Northwood, Ford, Arundel.
1644 II. and 1638 IV.—WALTER LANGMEAD, Wicks, Yapton, Arundel.
1644 III. and 1643 V.—WILLIAM H. PITTS, Woodhorn, Oving, Chichester.
1637 R.N.—LADY LUDLOW, Luton Hoo, Luton.
H.C.—1627, 1635. C.—1628, 1630, 1633.

¹ Prizes given by the Shropshire Sheep Breeders' Association.

² The "Hardwicke" Perpetual Silver Challenge Cup, given through the Shropshire Sheep Breeders' Association, for the best exhibit.

³ Champion Gold Medal, or £10 10s. in cash, given by the Southdown Sheep Society for the best Ram or Ram Lamb in Classes 237 to 239.

⁴ The "Northumberland" Perpetual Silver Challenge Cup given through the Southdown Sheep Society for the best exhibit.

⁵ Prizes, except Fifth, given by the Southdown Sheep Society.

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Class 240.—Three Southdown Shearling Rams.

- 1650 I.—HIS MAJESTY THE KING, Sandringham, Norfolk.
1654 II.—JOHN LANGMEAD & SONS, Northwood, Ford, Arundel.
1661 III.—SIR JEREMIAH COLMAN, BART., Gatton Park, Surrey.
1665 R.N.—LADY LUDLOW, Luton Hoo, Luton.
H.C.—1657. C.—1652, 1656, 1658.

Class 241.—Three Southdown Ram Lambs.

- 1674 I.—WILLIAM H. PITTS, Woodhorn, Oving, Chichester.
1687 II.—WALTER LANGMEAD, Wicks, Yapton, Arundel.
1688 III.—JOHN LANGMEAD & SONS, Northwood, Ford, Arundel.
1677 IV.—SIR SIDNEY WISHART, Binsted, Arundel.
1665 V.—THE GOODWOOD ESTATES CO., Goodwood, Chichester.
1672 R.N.—J. PIERPONT MORGAN, Wall Hall, Watford.
H.C.—1668, 1669. C.—1660, 1661, 1662, 1670.

Class 242.—Three Southdown Shearling Ewes.

- 1681 I. & Champion.¹—JOHN LANGMEAD & SONS, Northwood, Ford, Arundel.
1684 II. & R.N. for Champion.¹—J. PIERPONT MORGAN, Wall Hall, Watford.
1688 III.—SIR SIDNEY WISHART, Binsted, Arundel.
1682 IV.—LADY LUDLOW, Luton Hoo, Luton.
1686 R.N.—WILLIAM H. PITTS, Woodhorn, Oving, Chichester.
H.C.—1678, 1683. C.—1679, 1687.

Class 243.—Three Southdown Ewe Lambs.

- 1697 I.—JOHN LANGMEAD & SONS, Northwood, Ford, Arundel.
1699 II.—LADY LUDLOW, Luton Hoo, Luton.
1703 III.—MAJOR D. F. OSMASTON, Lowfold, Wisborough Green, Sussex.
1698 IV.—WALTER LANGMEAD, Wicks, Yapton, Arundel.
1704 V.—WILLIAM H. PITTS, Woodhorn, Oving, Chichester.
1708 R.N.—SIR SIDNEY WISHART, Binsted, Arundel.
H.C.—1691, 1700. C.—1692, 1693, 1694.

Hampshire Downs.

Class 244.—Hampshire Down Shearling Rams.

- 1719 I. and 1720 R.N.—THE EXORS. of JAMES GOLDSMITH, Blendworth, Horndean, Cosham, Hants.
1718 II.—MAJOR V. S. BLAND, The Warren, Aldbourne, Marlborough.
1709 III.—J. H. BENYON, Englefield House, Reading, for Englefield Bulwark L. 700.
1717 IV.—J. ONSLOW FANE, Steventon Manor, Hants., bred by Col. Sofer Whitburn, Ampert.
H.C.—1710. C.—1714.

Class 245.—Hampshire Down Ram Lambs.

- 1729 I.—J. ONSLOW FANE, Steventon Manor, Hants.
1725 II.—MAJOR V. S. BLAND, The Warren, Aldbourne, Marlborough.
1735 III.—P. C. TORY, Shapwick, Blandford.
1733 IV.—A. THOMAS LOYD, O.B.E., Lockinge House, Wantage, Berks.
1727 V.—E. CLIFTON-BROWN, Burnham Grove, Burnham, Bucks.
1728 R.N.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts.
H.C.—1730.

Class 246.—Three Hampshire Down Ram Lambs.

- 1742 I. & R.N. for Champion.²—A. THOMAS LOYD, O.B.E., Lockinge House, Wantage.
1744 II.—P. C. TORY, Shapwick, Blandford.
1737 III.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts.
1741 IV.—THE EXORS. of JAMES GOLDSMITH, Blendworth, Horndean, Cosham, Hants.
1743 R.N.—VISITING COMMITTEE, PARK PREWETT MENTAL HOSPITAL, Basingstoke.
H.C.—1738.

¹ Champion Silver Medal, or £1 in cash, given by the Southdown Sheep Society for the best Pen of Ewes or Ewe Lambs.

² Champion Prize of £10 given by the Hampshire Down Sheep Breeders' Association for the best exhibit.

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Class 247.—Three Hampshire Down Shearling Ewes.

- 1747 I.—E. CLIFTON-BROWN, Burnham Grove, Burnham, Bucks.
1748 II., and 1746 R.N.—J. H. BENYON, Englefield House, Reading.
1749 III.—J. ONSLOW FANE, Steventon Manor, Hants.
H.C.—1750.

Class 248.—Three Hampshire Down Ewe Lambs.

- 1754 I. & Champion.¹—MAJOR V. S. BLAND, The Warren, Aldbourne, Marlborough.
1761 II.—P. C. TORY, Shapwick, Blandford.
1755 III.—E. CLIFTON-BROWN, Burnham Grove, Burnham, Bucks.
1760 IV.—A. THOMAS LOYD, O.B.E., Lockinge House, Wantage, Berks.
1756 R.N.—J. ONSLOW FANE, Steventon Manor, Hants.
H.C.—1757.

Suffolks.

Class 249.—Suffolk Two Shear Rams.

- 1762 I.—MAJOR R. L. BARCLAY, C.B.E., Higham, Bury St. Edmunds, for Ashbocking Higham 1st 21524, bred by J. Lony, Ashbocking, Ipswich.
1766 II.—STUART PAUL, Kirton Lodge, Ipswich, for Kirton Mark 21826.
1768 III.—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill, for Wrattling Duke 22334.
1767 R.N.—SIR PRINCE PRINCE-SMITH, BART., Southburn House, Driffield, for Wrattling Renown 5th.

Class 250.—Suffolk Shearling Rams.

- 1777 I. & R.N. for Champion.¹—STUART PAUL, Kirton Lodge, Ipswich, for Benington Model 22295, bred by A. F. Bott, Benington Lordship, Stevenage.
1776 II.—LONDON COUNTY COUNCIL, HOLLESLEY BAY LABOUR COLONY, Woodbridge, for Colony Selection 22197.
1778 III.—STUART PAUL, Kirton Lodge, Ipswich.
1781 IV.—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill, for Wrattling Nob 22833.
1771 R.N.—EWER & PAWSEY, Clay Pits, Foxearth, Long Melford.
C.—1769.

Class 251.—Suffolk Ram Lambs.

- 1792 I.—STUART PAUL, Kirton Lodge, Ipswich.
1788 II.—EWER & PAWSEY, Clay Pits, Foxearth, Long Melford.
1790 III., and 1791 V.—LONDON COUNTY COUNCIL, HOLLESLEY BAY LABOUR COLONY, Woodbridge.
1794 IV.—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill.
1789 R.N.—JOHN R. KEEBLE & SON, Brantham Hall, Manningtree, Essex.

Class 252.—Three Suffolk Ram Lambs.²

- 1801 I.—LONDON COUNTY COUNCIL, HOLLESLEY BAY LABOUR COLONY, Woodbridge.
1802 II.—STUART PAUL, Kirton Lodge, Ipswich.
1797 III.—EWER & PAWSEY, Clay Pits, Foxearth, Long Melford.
1800 R.N.—JOHN R. KEEBLE & SON, Brantham Hall, Manningtree, Essex.

Class 253.—Three Suffolk Shearling Ewes.

- 1812 I. & Champion.¹—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill.
1809 II.—LONDON COUNTY COUNCIL, HOLLESLEY BAY LABOUR COLONY, Woodbridge.
1807 III.—MAJOR R. L. BARCLAY, C.B.E., Higham, Bury St. Edmunds.
1808 R.N.—G. S. GRAY, Graces Farm, Martyr Worthy, Winchester.

Class 254.—Three Suffolk Ewe Lambs.

- 1818 I.—EWER & PAWSEY, Clay Pits, Foxearth, Long Melford.
1817 II.—LONDON COUNTY COUNCIL, HOLLESLEY BAY LABOUR COLONY, Woodbridge.
1818 III.—STUART PAUL, Kirton Lodge, Ipswich.
1819 R.N.—FRANK SAINSBURY, Blunts Hall, Little Wrattling, Haverhill.
Cup.³—STUART PAUL.
R.N. for Cup.⁴—LONDON COUNTY COUNCIL, HOLLESLEY BAY LABOUR COLONY.

¹ Champion Prize of £10 given by the Hampshire Down Sheep Breeders' Association for the best exhibit.

² Perpetual Challenge Plate and £5 in cash given by the Suffolk Sheep Society for the best exhibit.

³ Prizes given by the Suffolk Sheep Society.

⁴ The "Southburn" Silver Challenge Cup given through the Suffolk Sheep Society for the most points awarded in a combination of entries.

Dorset Downs.

Class 255.—*Dorset Down Rams, Shearling and Upwards.*

- 1825 I., and 1824 R.N.—P. & C. SEWARD, Weston, Petersfield, Hants., for rams born in 1931.
 1822 II.—MRS. LIONEL DE ROTHSCHILD, Exbury House, Exbury, Southampton, for ram born in 1931.
 1821 III.—DEBENHAM & TORY, Anderson, Blandford, for ram born in 1931.

Class 256.—*Dorset Down Ram Lambs.¹*

- 1887 I. & Champion.² 1894 III., 1835 IV., and 1836 V.—P. & C. SEWARD, Weston, Petersfield, Hants.
 1880 II., and 1831 R.N.—MRS. LIONEL DE ROTHSCHILD, Exbury House, Exbury, Southampton.
 H.C.—1826, 1833. C.—1827, 1828.

Class 257.—*Dorset Down Shearling Ewes.*

- 1839 I. & R.N. for Champion.³—MAJOR G. F. DAVIES, M.P., Leigh House, Chard.
 1841 II.—DEBENHAM & TORY, Anderson, Blandford.
 1843 III.—MRS. LIONEL DE ROTHSCHILD, Exbury House, Exbury, Southampton.
 1845 R.N.—JOHN JOYCE, Milverton, Somerset.
 H.U.—1840, 1844. C.—1833.

Wiltshire or Western Horns.

Class 261.—*Wiltshire or Western Horn Rams, Two Shear and Upwards.³*

- 1846 I. & Champion.⁴—C. E. GILBY, Spratton, Northampton, for Brockhall Conquest 2440, born in 1929, bred by Brodie Bros., Brockhall, Weedon.
 1847 II.—A. GOWLING, Snowford Hall, Leamington Spa, for Upton Romeo 2522, born in 1930, bred by Kemp Spokes, Upton Lodge, Northampton.
 1843 III.—WILLIAM MORRIS, Tarry Lane, Yelvertoft, Rugby, for Brockhall Dandy 2660, born in 1930, bred by Brodie Bros., Brockhall, Weedon; s. Yelvertoft Warrior No. 1 2475, d. by Brockhall Surprise 52.

Class 262.—*Wiltshire or Western Horn Shearling Rams.*

- 1851 I. & R.N. for Champion.⁴—A. GOWLING, Snowford Hall, Leamington Spa, for Brockhall Radiance 2880, bred by Brodie Bros., Brockhall, Weedon.
 1853 II.—W. B. SOUTHERNWOOD, Gubblecote, Tring, Herts., for Beachampton Andrew, bred by G. F. Verey, Beachampton, Bletchley.
 1852 III.—WILLIAM MORRIS, Tarry Lane, Yelvertoft, Rugby, for Blackdown Defender.

Class 263.—*Two Wiltshire or Western Horn Shearling Ewes.*

- 1855 I.—W. B. SOUTHERNWOOD, Gubblecote, Tring, Herts.
 1857 II.—WILLIAM MORRIS, Tarry Lane, Yelvertoft, Rugby.
 1856 III.—A. GOWLING, Snowford Hall, Leamington Spa.

Ryelands.

Class 264.—*Ryeland Rams, Two Shear and Upwards.*

- 1861 I.—T. W. MONTAGUE PERKINS, Upton Court, Holme Lacy, Hereford, for Berrington Juror 2686, born in 1930, bred by Lord Cawley, Berrington Hall, Leominster.
 1859 II.—W. L. HORNBURY, Ettington Park, Stratford-on-Avon, for Clytha Typefounder 2256, born in 1928, bred by the late Mrs. Herbert-Huddleston, Clytha Park, Abergavenny.
 1860 III.—W. HAROLD HUMPHREYS, Wild Manor, Alresford, Hants., for Filkins Finder 2818, born in 1928, bred by Hon. R. S. Cripps, Goodfellows Farm, Filkins, Lechlade.

¹ Prizes, except Fourth and Fifth, given by the Dorset Down Sheep Breeders' Association.

² Champion Prize of £5 given by the Dorset Down Sheep Breeders' Association for the best exhibit.

³ Prizes given by the Wiltshire or Western Horn Sheep Society.

⁴ Silver Challenge Cup given by the Wiltshire or Western Horn Sheep Society for the best exhibit.

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Class 265.—Ryeland Shearling Rams.

- 1868 I. & Champion.¹—T. W. MONTAGUE PERKINS, Ufton Court, Holme Lacy, Hereford, for Pomona Blackmarston, bred by E. W. Langford, Ltd., Hafod Road, Hereford.
1864 II. & R.N. for Champion.¹—W. L. HORBURY, Ettington Park, Stratford-on-Avon, for Ettington Futurist.
1862 III.—W. L. HORBURY, for Ettington Farmer.
1863 R.N.—W. L. HORBURY, for Ettington Fascist.

Class 266.—Three Ryeland Ram Lambs.

- 1870 I.—W. L. HORBURY, Ettington Park, Stratford-on-Avon.
1873 II.—T. W. MONTAGUE PERKINS, Ufton Court, Holme Lacy, Hereford.
1872 III.—H. J. NICHOLSON, Upper Bordean, Petersfield, Hants.
1874 R.N.—CAPT. D. M. WILLS, Barley Wood, Wrington, Somerset.

Class 267.—Three Ryeland Shearling Ewes.

- 1878 I. & 1879 III.—T. W. MONTAGUE PERKINS, Ufton Court, Holme Lacy, Hereford.
1875 II.—W. L. HORBURY, Ettington Park, Stratford-on-Avon.
1877 R.N.—H. J. NICHOLSON, Upper Bordean, Petersfield, Hants.

Class 268.—Three Ryeland Ewe Lambs.

- 1881 I.—W. L. HORBURY, Ettington Park, Stratford-on-Avon.
1884 II.—T. W. MONTAGUE PERKINS, Ufton Court, Holme Lacy, Hereford.
1883 III.—H. J. NICHOLSON, Upper Bordean, Petersfield, Hants.
1885 R.N.—CAPT. D. M. WILLS, Barley Wood, Wrington, Somerset.

Kerry Hills (Wales).

Class 269.—Kerry Hill (Wales) Rams, Two Shear and Upwards.

- 1890 I. & Champion.¹—JOHN W. OWENS, Woodhouse, Shobdon, Herefordshire, for Winsbury Master 16601, born in 1930, bred by J. T. Beavan, Winsbury, Chirbury.
1891 II. & R.N. for Champion.¹—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for Eaton Vulcan 15928, born in 1930.
1889 III.—JOHN W. OWENS, for Presteign Witness 15511, born in 1929, bred by Howard Owens, The Moor, Presteign.
1887 R.N.—J. N. KENDALL, Brimpsfield Park, Glos., for St. Fagans Freeman.

Class 270.—Kerry Hill (Wales) Shearling Rams.

- 1892 I.—JOHN T. BEAVAN, Winsbury, Chirbury, Montgomery, for Winsbury Nero 17813.
1895 II.—JOHN W. OWENS, Woodhouse, Shobdon, Herefordshire, for Stockley Officer 17164.
1894 III.—JOHN W. OWENS, for Stockley Object 17159.
1893 R.N.—L. LITGOW, The Manor Farm, Shawell, Rugby, for Shawell Abbot.
H.C.—1896.

Class 271.—Kerry Hill (Wales) Ram Lambs.

- 1901 I., and 1902 R.N.—JOHN W. OWENS, Woodhouse, Shobdon, Herefordshire.
1903 II.—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester, for Eaton Yeoman.
1897 III.—JOHN T. BEAVAN, Winsbury, Chirbury, Montgomery, for Winsbury Orator.
H.C.—1898. C.—1899.

Class 272.—Three Kerry Hill (Wales) Shearling Ewes.

- 1904 I.—JOHN T. BEAVAN, Winsbury, Chirbury, Montgomery.
1907 II.—JOHN W. OWENS, Woodhouse, Shobdon, Herefordshire.
1906 III.—L. LITGOW, The Manor Farm, Shawell, Rugby.
1905 R.N.—J. N. KENDALL, Brimpsfield Park, Glos.

Class 273.—Three Kerry Hill (Wales) Ewe Lambs.²

- 1908 I.—JOHN T. BEAVAN, Winsbury, Chirbury, Montgomery.
1912 II.—JOHN W. OWENS, Woodhouse, Shobdon, Herefordshire.
1913 III.—THE DUKE OF WESTMINSTER, G.C.V.O., D.S.O., Eaton Hall, Chester.
1911 R.N.—L. LITGOW, The Manor Farm, Shawell, Rugby.
H.C.—1910.

¹ Silver Challenge Cup given through the Ryeland Flock Book Society for the best Shearling Ram.

² Silver Challenge Cup given through the Kerry Hill (Wales) Flock Book Society for the best exhibit.

³ Prizes given by the Kerry Hill (Wales) Flock Book Society.

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Clun Forest.

Class 274.—Clun Forest Rams, Shearling and Upwards.

- 1920 I.—MRS. DOROTHY M. B. SPEARMAN, Stagbatch House, Leominster, for Billy of Lawton Bury 1965, born in 1930, bred by W. R. Lyke, Lawton Bury, Leominster.
1915 II.—H. T. JONES, Mynde Farm, Bedstone, Bucknell, Shropshire, for Mynde Hero, born in 1931.
1918 III.—D. POWELL, Lower Kimbolton, Leominster, for Brookhampton Gem 1611, born in 1930, bred by J. T. Lutley, Brookhampton, Bromyard.
1916 E.N.—H. JOHN MARSH, Manor House, Bedstone, Bucknell, Shropshire, for Bedstone Heir.
H.C.—1914. C.—1917.

Class 275.—Three Clun Forest Shearling Ewes.¹

- 1921 I.—H. JOHN MARSH, Manor House, Bedstone, Bucknell, Shropshire.
1923 II.—MRS. DOROTHY M. B. SPEARMAN, Stagbatch House, Leominster.
1922 III.—MISS JERVOISE SMITH, Sandwell, Harberton, Devon.

Lincolns.

Class 276.—Lincoln Two Shear Rams.

- 1925 I. & Champion.²—ERNEST ADDISON, Riby Grange, Stallingborough, Lincs., for Riby Showman.
1929 II. & R.N. for Champion.²—MAJOR W. H. RAWNSLEY AND D. F. BROWETT, Well Vale, Alford, and Thornton, Horncastle, for Well Renown 18784, bred by Major W. H. Rawnsley.
1927 III.—CLIFFORD NICHOLSON, Willoughton Manor, Lincoln, for Horkstow Manor No. 75 of 1930.
1928 E.N.—MAJOR W. H. RAWNSLEY AND D. F. BROWETT, for Quarrington Top Price.

Class 277.—Lincoln Shearling Rams.

- 1930 I., and 1931 II.—ERNEST ADDISON, Riby Grange, Stallingborough, Lincs.
1936 III.—MAJOR W. H. RAWNSLEY AND D. F. BROWETT, Well Vale, Alford, and Thornton, Horncastle, bred by Major W. H. Rawnsley.
1932 E.N.—CHARLES E. HOWARD, Nocton Rise, Lincoln.
H.C.—1934.

Class 278.—Three Lincoln Shearling Rams.

- 1937 I.—ERNEST ADDISON, Riby Grange, Stallingborough, Lincs.
1943 II.—MAJOR W. H. RAWNSLEY AND D. F. BROWETT, Well Vale, Alford, and Thornton, Horncastle, bred by Major W. H. Rawnsley.
1940 III.—CLIFFORD NICHOLSON, Willoughton Manor, Lincoln.
1939 E.N.—CHARLES E. HOWARD, Nocton Rise, Lincoln.

Class 279.—Three Lincoln Ram Lambs.

- 1946 I.—ERNEST ADDISON, Riby Grange, Stallingborough, Lincs.
1948 II.—CLIFFORD NICHOLSON, Willoughton Manor, Lincoln.
1947 III.—CHARLES E. HOWARD, Nocton Rise, Lincoln.
1950 E.N.—MAJOR W. H. RAWNSLEY AND D. F. BROWETT, Well Vale, Alford, and Thornton, Horncastle.

Class 280.—Three Lincoln Ewe Lambs.

- 1953 I.—CLIFFORD NICHOLSON, Willoughton Manor, Lincoln.
1952 II.—CHARLES E. HOWARD, Nocton Rise, Lincoln.
1951 III.—ERNEST ADDISON, Riby Grange, Stallingborough, Lincs.

Wensleydales.

Class 289.—Wensleydale Rams, Two Shear and Upwards.

- 1954 I.—JOHN DARGUE, Burnside Hall, Kendal, for Bold Ranger 3686, born in 1929, bred by John Hargrave, Wath, Ripon.

¹ Prizes given by the Clun Forest Sheep Breeders' Association.

² Champion Prize of 25 given by the Lincoln Longwool Sheep Breeders' Association for the best Ram in Classes 276 and 277.

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- 1956 II.—J. B. SMALLEY, Birkby Hall, Cark-in-Cartmel, for Burneside Prince Christian 8859, born in 1929, bred by John Dargue, Burneside Hall, Kendal.
1955 III.—JOHN W. GREENSIT, Holme-on-Swale, Thirsk, for King John 8804, born in 1930, bred by John Hargrave, Wath, Ripon.

Class 290.—Wensleydale Shearling Rams.

- 1958 I. & R.N. for Champion.¹—JOHN W. GREENSIT, Holme-on-Swale, Thirsk.
1957 II.—JOHN DARGUE, Burneside Hall, Kendal.
1959 III.—JOHN PERCIVAL, Easthouse, Carperby, Yorks., bred by Philip Harvey, Clifford Hall, Burton-in-Lonsdale.
1961 R.N.—J. B. SMALLEY, Birkby Hall, Cark-in-Cartmel, Carnforth.

Class 291.—Three Wensleydale Shearling Rams.

- 1965 I.—JOHN PERCIVAL, Easthouse, Carperby, Yorks.
1963 II.—JOHN DARGUE, Burneside Hall, Kendal.
1967 III.—JOHN A. WILLIS, Manor House, Carperby, Yorks.
1964 R.N.—JOHN W. GREENSIT, Holme-on-Swale, Thirsk.

Class 292.—Wensleydale Shearling Ewes.

- 1974 I.—JOHN A. WILLIS, Manor House, Carperby, Yorks.
1969 II., and 1970 R.N.—JOHN W. GREENSIT, Holme-on-Swale, Thirsk.
1971 III.—JOHN PERCIVAL, Easthouse, Carperby, Yorks.

Class 293.—Wensleydale Yearling Ewes, shown in Wool.²

- 1977 I. & Champion.¹—J. B. SMALLEY, Birkby Hall, Cark-in-Cartmel, Carnforth.
1978 II.—JOHN A. WILLIS, Manor House, Carperby, Yorks.
1975 III.—JOHN W. GREENSIT, Holme-on-Swale, Thirsk.
1976 R.N.—JOHN PERCIVAL, Easthouse, Carperby, Yorks.

Kent or Romney Marsh.

Class 294.—Kent or Romney Marsh Two Shear Rams.

- 1981 I. & R.N. for Champion.³—J. EGERTON QUESTED, The Firs, Cheriton, Kent, for Quested's 205 of 1930 72838.
1980 II.—J. EGERTON QUESTED, for Quested's 146 of 1930 72800.
1979 III.—E. W. BAKER, Parsonage Farm, Bekebourne, Canterbury, for Baker's No. 21 of 1930 74087.

Class 295.—Kent or Romney Marsh Shearling Rams.

- 1985 I. & Champion.⁴—WILLIAM MILLER, Renville, Canterbury.
1990 II.—ASHLEY STEVENS, Davington Hall, Faversham, Kent.
1987 III.—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
1984 IV.—E. W. BAKER, Parsonage Farm, Bekebourne, Canterbury.
1993 R.N.—W. J. & A. D. WOOD, Teynham Court, Sittingbourne, Kent.
E.C.—1983, 1988.

Class 296.—Three Kent or Romney Marsh Shearling Rams.⁴

- 1999 I. 220, and 2000 IV. 25.—ASHLEY STEVENS, Davington Hall, Faversham, Kent.
1997 II. 215.—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
1995 III. 210.—E. W. BAKER, Parsonage Farm, Bekebourne, Canterbury.
1996 R.N.—WILLIAM MILLER, Renville, Canterbury.

Class 297.—Three Kent or Romney Marsh Ram Lambs.

- 2001 I.—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
2002 II.—ASHLEY STEVENS, Davington Hall, Faversham, Kent.

Class 298.—Three Kent or Romney Marsh Shearling Ewes.

- 2003 I. & Champion,⁵ and 2005 II. & R.N. for Champion.⁶—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
2006 III.—ASHLEY STEVENS, Davington Hall, Faversham, Kent.

¹ Silver Challenge Trophy given by the Wensleydale Longwool Sheep Breeders' Association for the best exhibit.

² Prizes given by the Wensleydale Longwool Sheep Breeders' Association.

³ Champion Prize of £10 10s. given by the Kent or Romney Marsh Sheep Breeders' Association for the best Ram in Classes 294 and 295.

⁴ Prizes given by the Kent or Romney Marsh Sheep Breeders' Association.

⁵ Champion Prize of £10 10s. given by the Kent or Romney Marsh Sheep Breeders' Association for the best Pen of Ewes or Ewe Lambs.

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Class 299.—Three Kent or Romney Marsh Ewe Lambs.

- 2008 I.—ASHLEY STEVENS, Davington Hall, Faversham, Kent.
2007 II.—J. EGERTON QUESTED, The Firs, Cheriton, Kent.

Devon Close Wools.

Class 300.—Devon Close Wool Rams, Shearling and Upwards.

- 2012 I.—A. R. LERWILL, Maddoxdown, Eastdown, Barnstaple, for ram, born in 1931.
2011 II.—F. JOSLIN, Stone Farm, Goodleigh, Barnstaple, for ram, born in 1931.
2010 III.—FREDERICK R. FRY, Wigmore Farm, East Down, Barnstaple, for Old Gold No. 11, born in 1931.
2009 R.N.—GEORGE BALMENT & SONS, Zephyr Cottage, Barnstaple, for Councillor.

Class 301.—Devon Close Wool Shearling Ewes.

- 2015 I.—A. R. LERWILL, Maddoxdown, Eastdown, Barnstaple.
2014 II.—FREDERICK R. FRY, Wigmore Farm, East Down, Barnstaple, for Devonshire Dimpling No. 11.
2018 III.—GEORGE BALMENT & SONS, Zephyr Cottage, Barnstaple.
2016 R.N.—JOHN RAY, Dean Head, Goodleigh, Barnstaple.

South Devons.

Class 302.—South Devon Shearling Ram.

- 2021 I.—H. WHITLEY, Primley House, Paignton.
2017 II.—W. C. BICE & SON, Nanswhyden, St. Columb, Cornwall, for Nanswhyden No. 7 of 1931 28438.
2018 III.—W. C. BICE & SON, for Nanswhyden No. 11 of 1931 28442.
2019 R.N.—J. N. GROSE, Penare, Gorran, Cornwall.

Class 303.—South Devon Ram Lambs, shown in Wool.¹

- 2025 I.—J. N. GROSE, Penare, Gorran, Cornwall.
2022 II.—W. C. BICE & SON, Nanswhyden, St. Columb, Cornwall.
2027 III., and 2026 R.N.—H. WHITLEY, Primley House, Paignton.

Class 304.—South Devon Shearling Ewes, shown in Wool.

- 2032 I., 2031 II., and 2030 III.—A. E. STIDSTON & SON, Court Barton, Thurlestone, Kingsbridge.
2029 R.N.—J. N. GROSE, Penare, Gorran, Cornwall.

Dartmoors.

Class 305.—Dartmoor Rams, Shearling and Upwards.

- 2034 I.—RICHARD P. LUCE, Lower Chaddlehanger, Tavistock, for Chaddlehanger Incur 4522, born in 1931.
2035 II.—RICHARD P. LUCE, for Sherford No. 4 4545, born in 1930, bred by J. W. Symons, Sherford, Brixton, Plymouth.
2036 III.—WILLIAM P. LUCE, Hillside, Lamerton, Tavistock, for South Warne No. 14 4523, born in 1931.
2037 R.N.—W. H. NEAL, Walreddon Farm, Tavistock, for Walreddon No. 7.
E.C.—2033.

Class 306.—Dartmoor Shearling Ewes.

- 2039 I., and 2040 II.—RICHARD P. LUCE, Lower Chaddlehanger, Tavistock.
2038 III.—GEORGE GLANFIELD, West Lake, Okehampton, Devon.

¹ Prizes given by the South Devon Flock Book Association.

PIGS.

The Prizes in each Class for Pigs are: First, £10; Second, £5; Third, £3; Fourth, £2; Fifth, £1.

[The numbers in brackets refer to the Tattoo or Ear Numbers of the Animals.]

Large Whites.

Class 311.—Large White Boars, born in or before 1930.

- 2043 I., Champion,¹ & R.N. for Champion.²—LORD DARESBURY, C.V.O., Walton Hall, Warrington, for Taunton Turk 25th 06009 (1459), born Jan. 25, 1928, bred by W. White & Sons, Pool Farm, Taunton; s. Taunton Champion Jay 3rd 53683, d. Bushes Amy 33rd 128554 by Boxed Turk 33117.
- 2042 II. & R.N. for Champion.³—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for Edmonton King David 328th 71865 (2076), born March 23, 1930, bred by Rackley & Sons, Ewhurst, Surrey; s. Bourne King David 223rd 55959, d. Edmonton Bonetta 18th 179628 by Bourne King David 145th 52358.
- 2053 III.—THE WOODBOROUGH HERD, Marden Hill, Devizes, for Walton Bandmaster 33rd 66153 (1037), born July 1, 1927, bred by Lord Daresbury, C.V.O., Walton Hall, Warrington; s. Walton Bandmaster 18th 53873, d. Walton Primrose 50th 151685 by Bourne King David 52nd 47549.
- 2055 IV.—EDWIN THOMLINSON, Hall Farm, Hutton Wandesley, Marston, York, for Tockwith Prince George 13th 08047 (2350), born Jan. 8, 1928; s. Packwood Prince Edward 57453, d. Armadale Champion Queen 7th 156096 by Bourne Jay 3rd 40497.
- 2046 V.—A. J. ELDER, City Mills, Dunfermline, Fife, for Touch Hercules 73110 (123), born Jan. 10, 1929; s. Tockwith Jay 9th 57989, d. Hawkhaw Sunshine 11th 170126 by Cholmondeley Hercules 52509.
- 2050 R.N.—J. PIERPONT MORGAN, Wall Hall, Watford, for Aldenham Thruster. H.C.—2053, 2054. C.—2047, 2052, 2056.

Class 312.—Large White Boars, born in 1931, before July 1.

- 2061 I.—SIR G. A. COOPER, BART., Hursley Park, Winchester, for Farley Signal 59th (166), born Jan. 25; s. Farley Signal 27th 76275, d. Farley Primrose 51st 204740 by Plain Signal 4th 61721.
- 2080 II.—CHIVERS & SONS, LTD., Histon, for Histon Expectation 13th (376), born Jan. 20; s. Caldmore Expectation 2nd 60279, d. Histon Lily 86th 170510 by Bourne King David 36487.
- 2064 III.—LORD DARESBURY, C.V.O., Walton Hall, Warrington, for Walton Boy 75th 78157 (2722), born Jan. 17; s. Walton Boy 39th 63159, d. Moreton May 10th 171354 by Bourne Baldwin 52255.
- 2065 IV.—JACK R. MAJOR, High Street, Ramsey, Hants., for Ramsey Baron 29th 77509 (729), born Jan. 8; s. Ramsey Baron 8th 72695, d. Hallstone Bella 5th 158438 by Caldmore Banner 5th 47717.
- 2059 V.—CHIVERS & SONS, LTD., for Histon Boy 5th (356), born Jan. 6; s. Aldenham Bonetta's Boy 63101, d. Histon Belle 224th 195086 by Spalding Bob 9th 53618.
- 2068 R.N.—WALTER W. RYMAN, Wall, Lichfield, for Wall Majestic. H.C.—2062, 2066, 2069, 2071. C.—2070.
- 2064, 2114, 2137, 2177 Special I.⁴—LORD DARESBURY, C.V.O., for Walton Boy 75th, Walton Wallflower 3rd, Walton Lassie 69th and Walton Queen Mary 42nd.
- 2065, 2122, 2144, 2164 Special II.⁴—WALTER W. RYMAN, for Wall Majestic, Wall Beautiful 11th, Wall Champion Queen 11th and Wall Champion Queen 10th.
- 2085, 2147, 2167, 2190 R.N. for Specials.⁴—ALFRED W. WHITE, for Spalding Banner 30th, Spalding Lady Mollington 45th, Spalding Superior 19th and Spalding Reine 21st.

Class 313.—Large White Boars, born in 1931, on or after July 1.⁴

- 2085 I.—ALFRED W. WHITE, Hillegom, Little London, Spalding for Spalding Banner 30th (1173), born July 9; s. Spalding Banner 21st 72859, d. Spalding Superior 4th 152084 by Spalding Bob 11th 53617.
- 2077 II.—ERNEST A. CROOKES, Rose Cottage Farm, Cutthorpe, Chesterfield, for Cutthorpe Banner 32nd (2956), born July 11; s. Newhall Banner 72465, d. Caldmore Queen E.T. 179036 by Edmonton Turk 18th 53509.

¹ Champion Gold Medal, or £5 cash, given by the National Pig Breeders' Association for the best Large White Boar.

² Silver Challenge Cup given by the National Pig Breeders' Association for the best Large White Pig.

³ Special Prizes of a Cup or £10 cash (First Prize) and £5 (Second Prize) given by the National Pig Breeders' Association for the best groups of four pigs, bred by Exhibitor. One Boar (at least) must be included in each group, and not more than one entry to be selected from any one Class.

⁴ Prizes, except Fourth and Fifth, given by the National Pig Breeders' Association.

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- 2082 III.—WALTER W. RYMAN, Wall, Lichfield, for Wall King David 46th (5166), born July 26; s. Bourne King David 12th 40515, d. Wall Champion Queen 8th 208024 by Wall Jay 27th 66101.
 2078 IV.—LORD DARESBURY, C.V.O., Walton Hall, Warrington, for Walton Boy 87th (8039), born July 15; s. Walton Boy 89th 66159, d. Walton Bonetta 4th 173292 by Bourne Bradbury 40429.
 2086 V.—H. W. WHITE, Weston Hills, Spalding, for Westacre Bradbury 583rd (8006), born July 17, bred by Alfred Lewis, Westacre, Kings Lynn; s. Creek Bradbury 10th 71145, d. Weston Princess 197796 by Ramsey Reality 2nd 69751.
 2075 R.N.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Turk 37th.
 H.C.—2076, 2081, 2084. C.—2087.

Class 314.—Large White Boars, born in 1932.

- 2096 I.—LORD DARESBURY, C.V.O., Walton Hall, Warrington, for Walton Turk 83rd (8207), born Jan. 5; s. Taunton Turk 25th 66009, d. Walton Queen Mary 7th 173878 by Dupplin Excellence 56889.
 2095 II.—LORD DARESBURY, C.V.O., for Walton Turk 82nd (8198), born Jan. 3; s. Taunton Turk 25th 66009, d. March Belle 8th 195978 by Westacre Bradbury 252nd 70279.
 2093 III.—ERNEST A. CROOKES, Rose Cottage Farm, Cutthorpe, Chesterfield, for Cutthorpe Banner 28th (8102), born Jan. 9; s. Newhall Banner 72465, d. Cutthorpe Queen 52nd 188730 by Edmonton King David 50th 60709.
 2097 IV.—D. R. DAYBELL & SON, Bottesford, Nottingham, for Bottesford Boy 21st (835), born Jan. 8; s. Walton Boy 42nd 78557, d. Bottesford Buttercup 115th 178878 by Edmonton Bradbury 8rd 56491.
 2106 V.—JACK R. MAJOR, High Street, Ramsey, Hants., for Ramsey Bradbury 25th (916), born Jan. 4; s. Ramsey Bradbury 24th 77529, d. Weston Catalina 6th 208420 by Ramsey Reality 2nd 69751.
 2109 R.N.—WALTER W. RYMAN, Wall, Lichfield, for Wall Jay 104th.
 H.C.—2091, 2098, 2099, 2104, 2108. C.—2092, 2105.

Class 315.—Large White Breeding Sows, born in or before 1930.

- 2122 I., Champion,¹ & Champion.—WALTER W. RYMAN, Wall, Lichfield, for Wall Beautiful 11th 191626 (1955), born July 24, 1928, farrowed March 2; s. Bourne King David 12th 40515, d. Wall Beautiful 161426 by Hallstone Premier 18th 48089.
 2124 II. & R.N. for Champion.—EDWIN THOMLINSON, Hall Farm, Hutton Wandesley, Marston, York, for Tookwith Blackberry 6th 182364 (2828), born Jan. 2, 1928, farrowed March 30; s. Packwood Prince Edward 57453, d. Histon Blackberry 2nd 147020 by Aldenham Master 86091.
 2114 III.—LORD DARESBURY, C.V.O., Walton Hall, Warrington, for Walton Wallflower 3rd 197714 (1917), born July 7, 1929, farrowed Jan. 17; s. Walton Boy 89th 66159, d. Whittingham Wallflower 12th 182912 by Aldenham Victor 55687.
 2127 IV.—W. WHITE & SON, Pool Farm, Taunton, for Taunton East Lass 8th 197208 (1658), born Jan. 8, 1929, farrowed Jan. 7; s. Duston Delegate 18th 52719, d. Histon East Lass 11th 147088 by Histon Wonder 88677.
 2118 R.N.—ERNEST HARDING, Packwood Grange, Dorridge, Birmingham, for Packwood Princess Pat 20th.
 H.C.—2120, 2121.

Class 316.—Large White Sows, born in 1931, before July 1.

- 2137 I.—LORD DARESBURY, C.V.O., Walton Hall, Warrington, for Walton Lassie 89th (2698), born Jan. 5; s. Walton Hercules 8th 73405, d. Walton Lassie 46th 197634 by Peakirk Bob 7th 57455.
 2131 II.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Perfection (863), born March 4; s. Histon Bob 45th 72008, d. Moreton Perfection 11th 181244 by Bourne Baldwin 52255.
 2134 III.—ERNEST A. CROOKES, Rose Cottage Farm, Cutthorpe, Chesterfield, for Cutthorpe Lady Beatrice 227th 204896 (2803), born Jan. 10; s. Marchington Herdsman 7th 72359, d. Cutthorpe Lady Beatrice 28th 129082 by Jay of Cutthorpe 37223.
 2136 IV.—ERNEST A. CROOKES, for Cutthorpe Lady Buttercup 130th (2785), born Jan. 6; s. Marchington Herdsman 7th 72359, d. Cutthorpe Lady Buttercup 102nd 179822 by Edmonton Turk 18th 56509.
 2130 V.—S. T. & M. L. BRUNT, The Manor House, Bexley, Kent, for Crayvalley Bonetta 204172 (30), born March 6; s. Woodborough Bradbury 10th 70483, d. Edmonton Bonetta 147th 194074 by Bourne King David 223rd 55959.
 2141 R.N.—CHARLES J. LYTLE, The Hayes, Hayes Lane, Kenley, Surrey, for Kenley Bonetta 4th.
 H.C.—2144, 2149. C.—2132, 2142.

¹ Silver Challenge Cup given by the National Pig Breeders' Association for the best Large White Pig.

² Champion Gold Medal, or £5 cash, given by the National Pig Breeders' Association for the best Large White Sow.

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Class 317.—Large White Sows, born in 1931, on or after July 1.

- 2167 I.—ALFRED W. WHITE, Hillegom, Little London, Spalding, for Spalding Superior 19th (1178), born July 9; s. Spalding Banner 21st 72859, d. Spalding Superior 4th 182084 by Spalding Bob 11th 53817.
 2164 II.—WALTER W. RYMAN, Wall, Lichfield, for Wall Champion Queen 10th (5105), born July 9; s. Wall Jay 27th 66101, d. Bourne Champion Queen 60th 145384 by Bourne King David 80th 40543.
 2152 III.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Amy 78th (S. 24), born July 15; s. Histon Wonder 76th 72087, d. Aldenham Amy 40th 187856 by Bourne Bar-None 290th 40353.
 2157 IV.—DEBENHAM & TORY, Bladen Farms, Briantspuddle, Dorchester, for Bladen Primrose 3rd (660), born July 19, bred by Sir Ernest Debenham, Bart., Bladen Farms; s. Walton Bob 12th 70187, d. Bladen Primrose 193114 by Shirley Banner 3rd 65848.
 2162 V.—H. & J. POWER, New Mills Farm, Walsall, for Palfrey Bashful Lady (104), born July 18; s. Caldmore King David 29th, d. Caldmore Finella 193428 by Taunton Turk 25th 86009.
 2155 R.N.—ERNEST A. CROOKES, Rose Cottage Farm, Cutthorpe, Chesterfield, for Cutthorpe Model 4th.
 H.C.—2159, 2161. C.—2163, 2168.

Class 318.—Large White Sows, born in 1932.

- 2177 I.—LORD DARESBURY, C.V.O., Walton Hall, Warrington, for Walton Queen Mary 42nd (3210), born Jan. 5; s. Taunton Turk 25th 66009, d. Walton Queen Mary 7th 173376 by Dupplin Excellence 56889.
 2175 II.—ERNEST A. CROOKES, Rose Cottage Farm, Cutthorpe, Chesterfield, for Cutthorpe Lady Buttercup 135th (8091), born Jan. 4; s. Whittingham Victor 18th 78413, d. Cutthorpe Lady Buttercup 100th 179320 by Edmonton Turk 18th 56509.
 2178 III.—LORD DARESBURY, C.V.O., for Walton Wallflower 6th (3268), born Jan. 17; s. Handley Bandmaster 7th 71803, d. Walton Wallflower 3rd 197714 by Walton Boy 30th 66159.
 2193 IV.—W. WHITE & SON, Pool Farm, Taunton, for Taunton Champion Bonetta 9th (443), born Jan. 1; s. Taunton Bradman 73027, d. Taunton Champion Bonetta 2nd 197202 by Spalding Baron 8th 57737.
 2184 V.—ERNEST HARDING, Packwood Grange, Dorridge, Birmingham, for Packwood Brocade 51st (3854), born Jan. 2; s. Packwood Champion King 77339, d. Packwood Brocade 48th by Peakirk Bob 11th 65889.
 2190 R.N.—ALFRED W. WHITE, Hillegom, Little London, Spalding, for Spalding Reine 21st.
 H.C.—2176, 2191. C.—2185, 2186.

Middle Whites.

Class 319.—Middle White Boars, born in or before 1930.

- 2200 I. Champion,¹ & Champion.²—G. H. ROSE, Laybrook Home Farm, Thakeham, Fulborough, for Laybrook Deliverance 67749 (64), born Jan. 8, 1929; s. Salts Deliverance 33rd 67927, d. Mistley Dorothy 284th 184684 by Hawthorn Sultan 15th 54668.
 2201 II.—MRS. HAYES SADLER, Roundstone Farm, Ferring, Sussex, for Norsbury Jupiter 2nd 75128 (3288), born March 19, 1930; s. Norsbury Jupiter 67829, d. Abberton Delves 174056 by Caldmore Revel Deliverance 58659.
 2196 III.—CHIVERS & SONS, LTD., Histon, Cambridge, for Fordon Marmion 74061 (84), born Feb. 1, 1929, bred by Joseph S. Hicks, High Fordon, Hummanby, Yorks; s. Fordon Dignity 2nd 67877, d. Wharfedale Marmora 166874 by Wharfedale Sunstar 51999.
 2198 R.N.—LESLIE K. OSMOND, Bealsby Hall, Grimsby, for Amport Jamieson 3rd.
 H.C.—2199. C.—2197.
 2201, 2257, 2275, 2307 Special I.—MRS. HAYES SADLER, for Norsbury Jupiter 2nd, Norsbury Welcome 46th, Norsbury Virtue 69th and Norsbury Virtue 81st.
 2204, 2212, 2230, 2252 Special II.—CHIVERS & SONS, LTD., for Histon Marmion 3rd, Histon Marmion 6th, Histon Bold Boy 2nd and Histon Hagar 36th.
 2203, 2226, 2260, 2279 R.N. for Specials.—SIR GOMER BERRY, BART., for Pendley Apollo 8th, Pendley Whimble, Pendley Dorothy and Pendley Helah.

¹ Champion Gold Medal, or 25 cash, given by the National Pig Breeders' Association for the best Middle White Boar.

² Silver Challenge Cup given by the National Pig Breeders' Association for the best Middle White Pig.

³ Special Prizes of a Gold Medal or 25 cash (First Prize) and a Silver Medal (Second Prize) given by the National Pig Breeders' Association for the best groups of four Pigs, bred by Exhibitor. One Boar (at least) must be included in each group, and not more than one entry to be selected from any one Class.

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Class 320.—Middle White Boars, born in 1931, before July 1.

- 2204 I.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Marmion 3rd (70), born March 22; s. Fordon Marmion 74061, d. Histon Choice 101st 184236 by Hammonds Herald 44353.
 2205 II.—CHIVERS & SONS, LTD., for Histon Marmion 5th (28), born Jan. 25; s. Fordon Marmion 74061, d. Histon Hagar 36th 199490 by Hammonds Herald 44353.
 2208 III.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for Pendley Apollo 8th (438), born May 14; s. Pendley Apollo 3rd 67847, d. Amport Fuchsia 10th 185914 by Wharfedale Jamieson 3rd 28341.
 2209 R.N.—LESLIE K. OSMOND, Beelsby Hall, Grimsby, for Beelsby Revel.
 H.C.—2207. C.—2211.

Class 321.—Middle White Boars, born in 1931, on or after July 1.¹

- 2212 I. & R.N. for Champion.²—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Marmion 6th (142), born July 27; s. Fordon Marmion 74061, d. Histon Rosebud 43rd 186808 by Hammonds Herald 44353.
 2224 II.—W. H. WINN-JONES, The Knoll, Sully, Glam., for Sully Gold Coin 2nd 75319 (105), born July 5; s. Langbourne Gold Coin 67727, d. Laybrook Bettina 3rd 199678 by Mistley Cornelius 54947.
 2223 III.—MRS. HAYES SADLER, Roundstone Farm, Ferring, Sussex, for Norsbury Woodman 13th (2664), born July 8; s. Norsbury Woodman 10th 74359, d. Norsbury Virtue 35th 200082 by Roundwood Robert 51179.
 2214 R.N.—HICK & SONS, Fordon, Wold Newton, Driffield, for Fordon Martin 3rd.
 H.C.—2217.

Class 322.—Middle White Boars, born in 1932.

- 2230 I.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Bold Boy 2nd (210), born Jan. 1; s. Shawlands Bold Boy 67965, d. Histon Rosadora 61st 175902 by Bookham Durbar 54229.
 2227 II.—E. W. & G. I. BROOKS, Shurbridge Farm, Sidlow, Reigate, for Shawlands Dignity 3rd (40), born Jan. 9; s. Fordon Dignity 2nd 67577, d. Shawlands Miss Dorothy 51st 202536 by Shawlands Bold Boy 67965.
 2244 III.—G. H. ROSE, Laybrook Home Farm, Thakeham, Pulborough, for Laybrook Apache (838), born Jan. 4; s. Pendley Record 75201, d. Mistley Grace 112th 202142 by Burningfold Perfection's Pride 10th 63019.
 2232 R.N.—T. H. GLADSTONE, Eastcote Grange, Hampton-in-Arden, for Barston Prince 2nd.
 H.C.—2242. C.—2239.

Class 323.—Middle White Breeding Sows, born in or before 1930.

- 2257 I., R.N. for Champion.³ & Champion.⁴—MRS. HAYES SADLER, Roundstone Farm, Ferring, Sussex, for Norsbury Welcome 45th 200088 (2218), born July 10, 1929, farrowed Feb. 8; s. Norsbury Hivite 2nd 67815, d. Norsbury Welcome 2nd 120932 by Norsbury Vaughan 39201.
 2256 II. & R.N. for Champion.⁴—LESLIE K. OSMOND, Beelsby Hall, Grimsby, for Amport Helah 6th 185922 (0802), born Dec. 12, 1927, farrowed April 18, bred by Mrs. Sofer Whitburn, Fox Farm, Amport, Andover; s. Amport Scotty 54148, d. Amport Helah 174142 by Wharfedale Deliverance 32575.
 2252 III.—CHIVERS & SONS, LTD., Histon, Cambridge, for Histon Hagar 36th 199490 (485), born Jan. 7, 1929, farrowed Jan. 6; s. Hammonds Herald 44353, d. Lancefield Athara 164846 by Pendley Don 2nd 55029.
 2251 R.N.—E. W. & G. I. BROOKS, Shurbridge Farm, Sidlow, Reigate, for Shawlands Miss Dorothy 51st.
 H.C.—2249.

Class 324.—Middle White Sows, born in 1931, before July 1.

- 2260 I.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for Pendley Dorothy 202330 (413), born Jan. 15; s. Pendley Bugle Boy 74877, d. Mistley Dorothy 292nd 202080 by Burningfold Perfection's Pride 10th 63019.
 2264 II.—T. H. GLADSTONE, Eastcote Grange, Hampton-in-Arden, for Barston Holly 8th (587), born Feb. 14; s. Pendley Prince 6th 67909, d. Salts Lady Holly 185910 by Salts Councillor 51205.

¹ Prizes given by the National Pig Breeders' Association.

² Champion Gold Medal, or £5 cash, given by the National Pig Breeders' Association for the best Middle White Boar.

³ Silver Challenge Cup given by the National Pig Breeders' Association for the best Middle White Pig.

⁴ Champion Gold Medal, or £5 cash, given by the National Pig Breeders' Association for the best Middle White Sow.

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- 2261 III.—E. W. & G. I. BROOKS, Shurbridge Farm, Sidlow, Reigate, for Shawlands Miss Dorothy 83rd 202544 (785), born Jan. 2, bred by the late Miss R. B. Babcock, Shawlands, Lingfield; s. Oxney Delivery 67077, d. Mistley Dorothy 193rd 176370 by Woodman of Hawthorn 30751.
- 2262 IV.—CHIVERN & SONS, LTD., Ilston, Cambridge, for Ilston Choice 141st (3), born Jan. 18; s. Fordon Marimon 74061, d. Ilston Choice 102nd 184238 by Hammonds Herald 44353.
- 2275 V.—MRS. HAYES SADLER, Roundstone Farm, Ferring, Sussex, for Norsbury Virtue 69th 202262 (2540), born Jan. 3; s. Norsbury Whelk 2nd 74357, d. Norsbury Welcome 35th 200082 by Roundwood Robert 51179.
- 2271 R.N.—LADY H. ROGER, Yockley House, Camberley, for Yockley Rose 4th. H.C.—2259, 2274. C.—2265, 2270, 2276.

Class 325.—Middle White Sows, born in 1931, on or after July 1.

- 2279 I.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring, Herts., for Pendley Helah (447), born July 7; s. Amport Scotty 11th 62899, d. Salts Helah 14th 177278 by Wharnciffe Prince 32625.
- 2277 II.—FRANKLIN BATCHELOR, Cooling Court, Rochester, for Cooling Rosa 15th (585), born Aug. 20; s. Amport Illustrious 73901, d. Cooling Rosa 2nd 198942 by Wattle Knight 82nd 67321.
- 2293 III.—W. H. WINN-JONES, The Knoll, Sully, Glam., for Sully Bettina 5th 202646 (119), born July 12; s. Langbourne Gold Coin 87727, d. Sully Bettina 200583 by Laybrook David 67743.
- 2286 IV.—LADY LODER, Leonardslee, Horsham, for Grinstead Hagar 8th (70), born Aug. 9; s. Norsbury Jonathan 67825, d. Copyhold Hagar 3rd 201210 by Mistley Prophet 67025.
- 2285 R.N.—LESLIE K. OSMOND, Beelsby Hall, Grimsby, for Beelsby Bettina. H.C.—2281. C.—2291.

Class 326.—Middle White Sows, born in 1932.

- 2305 I.—G. H. ROSE, Laybrook Home Farm, Thakeham, Fulborough, for Laybrook Graceful 3rd (841), born Jan. 4; s. Pendley Record 75201, d. Mistley Grace 112th 202142 by Burnfield Perfection's Pride 10th 68019.
- 2296 II.—E. W. & G. I. BROOKS, Shurbridge Farm, Sidlow, Reigate, for Shawlands Miss Dorothy 68th (42), born Jan. 9; s. Fordon Dignity 2nd 67577, d. Shawlands Miss Dorothy 51st 202536 by Shawlands Bold Boy 67965.
- 2304 III.—LESLIE K. OSMOND, Beelsby Hall, Grimsby, for Beelsby Helah 4th (478), born Jan. 1; s. Amport Jamieson 3rd 67401, d. Amport Helah 8th 185926 by Amport Scotty 54143.
- 2307 IV.—MRS. HAYES SADLER, Roundstone Farm, Ferring, Sussex, for Norsbury Virtue 51st (2825), born Jan. 2; s. Castlecroft Battle-axe 74785, d. Norsbury Virtue 35th 200082 by Roundwood Robert 51179.
- 2306 R.N.—MRS. HAYES SADLER, for Norsbury Virtue 30th. H.C.—2295. C.—2308.

Berkshires.

Class 333.—Berkshire Boars, born in or before 1930.

- 2314 I. Champion,¹ & R.N. for Champion.—FRANK TOWNEND, Highfield, Moor Allerton, Leeds, for Highfield Boy President 6th 1688, born July 25, 1925; s. Highfield Royal President 2nd 389, d. Harewood Bridget 1253 by Herriard Clondyke 28100.
- 2313 II.—SHEPHERD & DENTON, Waltons Farm, Baydon, Wilts., for Bridge Furors 2769, born Jan. 5, 1929, bred by Julius Fricker, Junr., Bridge Farm, Hardington, Yeovil; s. Bungays Highcard 2371, d. Bridge Dahlia 7414 by Iwerne Exchequer 784.
- 2310 III.—H. C. INWOOD, Ridgemoor, Burgholere, Newbury, for Ridgemoor Pygmalion 8th 8835, born Aug. 7, 1929; s. Highfield Royal Pygmalion 13th 2077, d. Hillfoot Princess 3rd 7960 by Famber Ace of Spades 25757.
- 2309 R.N.—E. CLIFTON-BROWN, Burnham Grove, Burnham, Bucks., for Burnham Nell. H.C.—2311, 2312.

Class 334.—Berkshire Boars, born in 1931, before July 1.

- 2319 I.—H. C. INWOOD, Ridgemoor, Burgholere, Newbury, for Ridgemoor Pygmalion 9th, born April 1; s. Highfield Royal Pygmalion 13th 2077, d. Hillfoot Princess 3rd 7960 by Famber Ace of Spades 25757.
- 2320 II.—H. C. P. JONES, Hillsborough Fruit Farm, Canford, Wimborne, for Hillsborough Hercules 8508, born Jan. 9; s. Rudgate Hercules 2595, d. Canford Miss Prim 2nd 6997 by Euclid Bachelor 1411.

¹ Champion Gold Medal, or £5 cash, given by the National Pig Breeders' Association for the best Berkshire Boar.

² The "Eaton" Silver Challenge Cup given through the National Pig Breeders' Association for the best Berkshire Pig.

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- 2818 III.—H. C. INWOOD, for Ridgemoor President, born Feb. 11; s. Highfield Royal Pygmalion 13th 2077, d. Hillfoot Miss 2nd 11750 by Hillfoot Premier 2885.
2815 R.N.—S. CECIL ARMITAGE, Lenton Fields, Nottingham, for Lenton Keystone.
C.—2817.

Class 335.—Berkshire Boars, born in 1931, on or after July 1.¹

- 2821 I. & R.N. for Champion.*—S. CECIL ARMITAGE, Lenton Fields, Nottingham, for Lenton British Duke 3541, born July 12; s. Lenton British Baron 2nd 2135, d. Lenton Grand Duchess 3rd 10942 by Leadenham Duke 748.
2825 II.—H. C. INWOOD, Ridgemoor, Burghclere, Newbury, for Ridgemoor Nonsuch, born July 15; s. Highfield Royal Pygmalion 13th 2077, d. Dunmanor Columbia 7th 7712 by Basildon Bombardier 1168.
2822 III.—S. CECIL ARMITAGE, for Lenton British Duke 2nd 3543, born July 13; s. Lenton British Baron 2nd 2135, d. Lenton Grand Duchess 10938 by Leadenham Duke 748.
2823 IV.—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for Swinton Hector, born July 22; s. Woodhouse Amanullah 2nd 2691, d. Swinton Hetty Margaret 10020 by Highfield Roy President 6th 1688.
2829 R.N.—T. E. PREST, Chapel Farm, Swinton, Malton, for Chapel President 6th.
H.C.—2824. C.—2826.

Class 336.—Berkshire Boars, born in 1932.

- 2831 I.—S. CECIL ARMITAGE, Lenton Fields, Nottingham, for Lenton Keystone 3rd, born Jan. 5; s. Bridge Keystone 1961, d. Lenton Grand Duchess 10938 by Leadenham Duke 748.
2830 II.—S. CECIL ARMITAGE, for Lenton Keystone 2nd, born Jan. 5; s. Bridge Keystone 1961, d. Lenton Grand Duchess 10938 by Leadenham Duke 748.

Class 337.—Berkshire Breeding Sows, born in or before 1930.

- 2839 I., Champion,³ & Champion.*—H. C. INWOOD, Ridgemoor, Burghclere, Newbury, for Hillfoot Miss 2nd 11750, born July 30, 1929, farrowed Feb. 8, bred by G. W. Taylor, Hillfoot Farm, Burnham, Berks.; s. Hillfoot Premier 2885, d. Hillfoot Madam 9536 by Hillfoot Count 1696.
2840 II.—H. C. INWOOD, for Ridgemoor Golden Melody 3rd 12014, born July 2, 1929, farrowed March 22; s. Highfield Royal Pygmalion 13th 2077, d. Ridgemoor Golden Melody 8534 by Motcombe Scott 22259.
2836 III.—S. CECIL ARMITAGE, Lenton Fields, Nottingham, for Bridge Primrose 11506, born July 1, 1930, farrowed March 3, bred by J. Fricker, Junr., Bridge Farm, Hardington, Yeovil; s. Bridge Keystone 1961, d. Bridge Patience 7432 by Iwerne Exchequer 784.
2841 R.N.—H. G. P. JONES, Hillsborough Fruit Farm, Canford, Wimborne, for Woodhouse Reputation 2nd.
H.C.—2837. C.—2842.

Class 338.—Berkshire Sows, born in 1931, before July 1.

- 2845 I. & R.N. for Champion.*—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for Swinton Precious Margaret 6th, born Jan. 4; s. Woodhouse Amanullah 2nd 2691, d. Swinton Bold Margaret 7th 11172 by Highfield Roy President 6th 1688.
2850 II.—H. G. P. JONES, Hillsborough Fruit Farm, Canford, Wimborne, for Hillsborough Bright 5th 11770, born Jan. 4; s. Hillsborough Mr. Prim 2nd 2897, d. Canford Bright Girl 6th 7544 by Stonehenge Druid 1580.
2851 III.—FRANK TOWNEND, Highfield, Moor Allerton, Leeds, for Highfield Princess Royal 71st 12652, born Jan. 15; s. Godinton Sweet King 2443, d. Highfield Princess Royal 50th 7922 by Highfield Royal Pygmalion 3rd 852.
2849 R.N.—H. C. INWOOD, Ridgemoor, Burghclere, Newbury, for Ridgemoor Princess Phyllis.
H.C.—2844. C.—2847.

Class 339.—Berkshire Sows, born in 1931, on or after July 1.

- 2857 I.—H. C. INWOOD, Ridgemoor, Burghclere, Newbury, for Ridgemoor Prolific, born July 4; s. Ridgemoor Pygmalion 8th 8335, d. Woodhouse Prolific 4th 11440 by Canford Bright Boy 1859.
2859 II.—H. G. P. JONES, Hillsborough Fruit Farm, Canford, Wimborne, for Hillsborough Mannequin 10th, born July 17; s. Hillsborough Peacemaker 2nd 3517, d. Hillsborough Mannequin 8th 11732 by Hillsborough Mr. Prim 4th 2901.

¹ Prizes, except Fourth, given by the National Pig Breeders' Association.

² Champion Gold Medal, or £5 cash, given by the National Pig Breeders' Association for the best Berkshire Boar.

³ The "Eaton" Silver Challenge Cup given through the National Pig Breeders' Association for the best Berkshire Pig.

⁴ Champion Gold Medal, or £5 cash, given by the National Pig Breeders' Association for the best Berkshire Sow.

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- 2353 III.—S. CECIL ARMITAGE, Lenton Fields, Nottingham, for Lenton Grand Duchess 6th 12744, born July 13; s. Lenton British Baron 2nd 2135, d. Lenton Grand Duchess 10088 by Leadenham Duke 748.
 2354 R.N.—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for Swinton Active Margaret.
 H.C.—2358. C.—2352, 2356, 2360.

Class 340.—Berkshire Sows, born in 1932.

- 2365 I.—H. C. INWOOD, Ridgemoor, Burghclere, Newbury, for Ridgemoor Golden Shower 2nd, born Jan. 3; s. Ridgemoor Pygmalion 8th 3335, d. Ridgemoor Golden Shower 8536 by Motcombe Scott 22259.
 2361 II.—S. CECIL ARMITAGE, Lenton Fields, Nottingham, for Lenton Grand Duchess 8th, born Jan. 5; s. Bridge Keystone 1981, d. Lenton Grand Duchess 10988 by Leadenham Duke 748.
 2362 III.—MAJOR CLIVE BEHRENS, Swinton Grange, Malton, for Swinton Turry Margaret, born Jan. 7; s. Woodhouse Amanullah 2nd 2691, d. Swinton Topsy Margaret 12954 by Highfield Royal President 22nd 2061.
 2364 R.N.—JULIUS FRICKER, Marsh Farm, Stalbridge, Dorset, for Suddon Bright Girl.
 H.C.—2363.

Wessex Saddlebacks.

Class 341.—Wessex Saddleback Boars, born in or before 1930.

- 2367 I., Champion,¹ & Champion.²—A. FREELAND, Billingbear Farm, Binfield, Berks., for Godalming Forester 2nd 3451, born Jan. 20, 1930; s. Godalming Masterpiece 3rd 3242, d. Preston Safrida 2nd 15201 by Brandon Tomahawk 2nd 2879.
 2371 II.—DOUGLAS VICKERS, Preston, Hitchin, for Preston Verdun 3470, born Jan. 30, 1930; s. Preston Dandy 2935, d. Preston Vain 12274 by Norman King Offa 219.
 2368 III.—FRED W. GENTLE, 38, High Street, Brandon, Suffolk, for Slythhurst Cashier 3416, born July 1, 1930, bred by Dr. W. H. Forshaw, Ewhurst, Guildford; s. Carlos of Slythhurst 8024, d. Slythhurst Charmaine 14710 by Slythhurst Bar-None 2836.
 2370 R.N.—DOLPHIN SMITH, Mackrey End, Harpenden, for Besford Hero 4th.

Class 342.—Wessex Saddleback Boars, born in 1931.³

- 2377 I. & R.N. for Champion.¹—DOUGLAS VICKERS, Preston, Hitchin, for Preston Defender 3477, born Jan. 5; s. Yarty Monarch 3rd 3282, d. Preston Dagmar 2nd 15181 by Preston Valentine 3111.
 2373 II.—FRED W. GENTLE, 38, High Street, Brandon, Suffolk, for Brandon David 3495, born Jan. 1; s. Brandon Dunstan 3161, d. Brandon Daybreak 14329 by Preston Dunstan 2987.
 2375 III.—MAJOR-GEN. SIR WYNDHAM KNIGHT, Pamber Place, Basingstoke, for Pamber Vim 3543, born March 15; s. Preston Vim 3364, d. Eleanor of Lavington 13791 by Godalming Victor 1669.
 2376 R.N.—DOLPHIN SMITH, Mackrey End, Harpenden, for Harpenden Hero.
 H.C.—2378.

Class 343.—Wessex Saddleback Boars, born in 1932.

- 2384 I.—MAJOR ALAN R. WHITTINGTON, Yarty, Axminster, for Yarty Choice 2nd 3601, born Jan. 3; s. Chellaston Royal Son 3449, d. Yarty Rita 3rd 16013 by Rookahill Rex 3260.
 2382 II.—DOUGLAS VICKERS, Preston, Hitchin, for Preston Selim 3608, born Jan. 2; s. Godalming Masterpiece 3rd 3242, d. Preston Spot 15373 by Chellaston Gene Away 2159.
 2380 III.—FRANK W. GILBERT, The Manor, Chellaston, Derby, for Chellaston Royalist 3595, born Jan. 5; s. Chellaston Royal Son 2nd 3450, d. Chellaston Sally 10th 15326 by Besford Hero 1st 3168.
 2379 R.N.—JESSE CRUMPLER, Longlands, North Coker, Yeovil, for Coker Master.

Class 344.—Wessex Saddleback Breeding Sows, born in or before 1930.

- 2390 I., R.N. for Champion,¹ & Champion.²—HENRY T. HOLLOWAY, West Lavington, Devizes, for Lavington Dora 2nd 15708, born May 31, 1930, farrowed Jan. 5; s. Nurscombe Factor 3037, d. Bromham Lady Eleanor 13495 by Godalming Victor 1669.
 2392 II.—DOUGLAS VICKERS, Preston, Hitchin, for Preston Venus 15325, born Feb. 27, 1929, farrowed Jan. 5; s. Preston Dandy 2935, d. Preston Vain 12274 by Norman King Offa 219.

¹ Champion Silver Gilt Medal, or £2 10s. cash, given by the National Pig Breeders' Association for the best Wessex Saddleback Boar.

² Silver Challenge Cup given by the National Pig Breeders' Association for the best Wessex Saddleback Pig.

³ Prizes given by the National Pig Breeders' Association.

⁴ Champion Silver Gilt Medal, or £2 10s. cash, given by the National Pig Breeders' Association for the best Wessex Saddleback Sow.

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- 2898 III.—DOUGLAS VICKERS, for Preston Diadem 2nd 15876, born Jan. 10, 1930, farrowed Feb. 25; s. Yarty Monarch 8rd 3282, d. Preston Diamond 15183 by Brandon Tomahawk 2nd 2879.
 2894 IV.—MAJOR ALAN R. WHITTINGTON, Yarty, Axminster, for Yarty Dinah 6th 15022, born Aug. 8, 1929, farrowed March 21; s. Rookhill Rex 3260, d. Yarty Dinah 5th 15041 by Yarty Monarch 8188.
 2888 R.N.—FRED W. GENTLE, 83, High Street, Brandon, Suffolk, for Preston Saba. H.C.—2387. G.—2391.

Class 345.—Wessex Saddleback Sows, born in 1931.

- 2404 I. & R.N. for Champion.—MAJOR ALAN R. WHITTINGTON, Yarty, Axminster, for Yarty Fancy 1st, born March 8; s. Holmsleigh Friar 3382, d. Yarty Dinah 6th 15622 by Rookhill Rex 3260.
 2397 II.—FRED W. GENTLE, 83, High Street, Brandon, Suffolk, for Brandon Daybreak 4th 15938, born Jan. 1; s. Brandon Dunstan 3161, d. Brandon Daybreak 14829 by Preston Dunstan 2937.
 2403 III.—DOUGLAS VICKERS, Preston, Hitchin, for Preston Delia 2nd 16312, born March 24; s. Godalming Masterpiece 3rd 3242, d. Preston Duchess 15184 by Brandon Tomahawk 2nd 2879.
 2399 IV.—HENRY T. HOLLOWAY, West Lavington, Devizes, for Lavington Empress 15930, born Jan. 1; s. Preston Vim 3384, d. Preston Shadow 15203 by Oakley Prior 1678.
 2398 R.N.—FRANK W. GILBERT, The Manor, Chellaston, Derby, for Sockhill Scamp 13th. H.C.—2401. G.—2400.

Class 346.—Wessex Saddleback Sows, born in 1932.

- 2403 I.—FRANK W. GILBERT, The Manor, Chellaston, Derby, for Chellaston Sally 13th 16349, born Jan. 5; s. Chellaston Royal Son 2nd 3450, d. Chellaston Sally 10th 15826 by Besford Hero 1st 8168.
 2410 II.—G. R. SOUTHWELL, Holbury Farm, Lockerley, Romsey, Hants., for Holbury Rosaline 16336, born Jan. 29; s. Forest Master 3353, d. Holbury Recollection 15655 by Awebridge Standard 2646.
 2412 III.—DOUGLAS VICKERS, Preston, Hitchin, for Preston Solo 16322, born Jan. 2; s. Godalming Masterpiece 3rd 3242, d. Preston Spot 15372 by Chellaston Gone Away 2159.
 2407 IV.—JESSE CRUMPLER, Longlands, North Coker, Yeovil, for Coker Syrene 2nd 16382, born Jan. 20; s. Coker Conqueror 3436, d. Coker Syrilene 15766 by Godalming Masterpiece 2nd 3243.
 2406 R.N.—JESSE CRUMPLER, for Coker Syrica 2nd. H.C.—2413. G.—2411.

Large Blacks.

Class 347.—Large Black Boars, born in or before 1930.

- 2417 I. & Champion.—D. W. P. GOUGH, Pakenham Manor, Bury St. Edmunds, for Tartar Anticipation F 881, born Jan. 7, 1929, bred by G. A. Goodchild, Great Yeldham; s. Tartar Sample D 109, d. Tartar Victoria 8th A. 8768 by Drayton Mikado 1st 11859.
 2415 II. & R.N. for Champion.—THE EARL OF DARTMOUTH, K.C.B., Patshull House, Wolverhampton, for Patshull Leader 2nd F. 325, born July 10, 1929; s. Tinton Leader C. 849, d. Patshull Susan 4th D. 594 by Patshull Prince 1st B. 405.
 2416 III.—FRANK W. GILBERT, The Manor, Chellaston, Derby, for Pakenham Luerstive G. 288, born April 15, 1930, bred by D. W. P. Gough, Pakenham Manor, Bury St. Edmunds; s. Pakenham Candidate F. 241, d. Pakenham Lucy 4th E. 606 by Awton Sampson 21891.
 2420 R.N.—R. E. WATKINS, Rainhill Piggeries, Mill Lane, Rainhill, Liverpool, for Trelay Blue Blood 15th.
 2417, 2457, 2467 Gold Vase.—D. W. P. GOUGH, for Tartar Anticipation, Fowlmere Fancy 25th and Fowlmere Fancy 45th.
 2415, 2455, 2465 R.N. for Gold Vase.—THE EARL OF DARTMOUTH, K.C.B., for Patshull Leader 2nd, Patshull Bangle 10th and Patshull Bangle 24th.

¹ Champion Silver Gilt Medal, or £2 10s. cash, given by the National Pig Breeders' Association for the best Wessex Saddleback Sow.

² Silver Challenge Cup, and Gold Medal to the Breeder, given by the Large Black Pig Society for the best Boar.

³ The "Baydon" Gold Vase given through the Large Black Pig Society for the best Group consisting of one Boar from Classes 347, 348 or 349, one Breeding Sow from Class 351, and one Sow from Classes 351, 352 or 353.

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Class 348.—Large Black Boars, born in 1931, before July 1.

- 2424 I.—D. W. P. GOUGH, Pakenham Manor, Bury St. Edmunds, for Pakenham Rotation H. 303, born Jan. 24; s. Tartar Anticipation F. 381, d. Pakenham Rosette 1st E. 1842 by Valley Quality C. 178.
 2426 II.—WILLIAM WILLS, Lynton Dene, Hoadley, Hants., for Lustleigh Valour H. 95, born Feb. 20; s. Cornwood Valesman C. 871, d. Lustleigh Marchioness 78th C. 2386 by Lustleigh Best Man B. 519.
 2427 III.—W. W. WOOLLAND, Baydon Manor, Ramsbury, Marlborough, for Baydon King 5th H. 289, born May 2; s. Brent H. J. K. F. 437, d. Baydon Nightingale 72nd F. 1604 by Baydon Satisfied 5th E. 449.
 2425 R.N.—SIR EDWARD MANN, BART., Thelveton Hall, Diss, for Thelveton Hero 29th.

Class 349.—Large Black Boars, born in 1931, on or after July 1.¹

- 2437 I.—W. W. WOOLLAND, Baydon Manor, Ramsbury, Marlborough, for Baydon Finalist H. 241, born July 19; s. Baydon Chief G. 311, d. Baydon Nightingale 52nd E. 162 by Valley General 2nd 25401.
 2438 II.—LECKFORD ESTATE, LTD., Leckford, Stockbridge, Hants., for Leckford Bandmaster H. 309, born July 13; s. Tillington Highlander 7th G. 477, d. Leckford Berwick F. 1898 by Kibbear Royal Prior 5th C. 119.
 2435 III.—WALTER J. WARREN, Deacons Farm, Staplegrove, Taunton, for Kibbear Royal Friend H. 819, born July 18; s. Kibbear Royal Jimmy F. 51, d. Kibbear Lady Beauty 1st G. 22 by Kibbear Royal Henry 1st D. 679.
 2431 R.N.—R. GYNN & SON, Treslay, Boscastle, Cornwall, for Treslay Bumper 1st.
 H.C.—2434. C.—2430.

Class 350.—Large Black Boars, born in 1932.

- 2442 I.—JOHN H. GLOVER, Cornwood, Devon, for Cornwood Monarch 2nd K. 1, born Jan. 8; s. West Newton Premier G. 855, d. Cornwood Lass 101st G. 1734 by Patchull Monarch 1st D. 425.
 2443 II.—D. W. P. GOUGH, Pakenham Manor, Bury St. Edmunds, for Pakenham Budget K. 69, born Jan. 14; s. Tartar Anticipation F. 381, d. Pakenham Lucy 2nd E. 10 by Awton Sampson 21891.
 2441 III.—FRANK W. GILBERT, The Manor, Chellaston, Derby, for Chellaston Climber K. 26, born Jan. 8; s. Chellaston Bouncer H. 83, d. Streetly Bangle 50th E. 1636 by Streetly Climber D. 597.
 2444 IV.—D. W. P. GOUGH, for Pakenham Economy K. 15, born Jan. 11; s. Yam Bak 2nd F. 129, d. Pakenham Moonbeam 2nd E. 14 by Drayton Proconsul C. 985.
 2446 V.—T. F. JAMES, Chantersluer Farm, Norwood Hill, Horley, for Treluckey John K. 8, born Jan. 5; s. Fowlmire Duke G. 479, d. Treluckey Black Lady 49th G. 862 by Valley Satisfaction 2nd D. 673.
 2449 R.N.—WALTER J. WARREN, Deacons Farm, Staplegrove, Taunton, for Kibbear Royal Prior 9th.
 H.C.—2443. C.—2439.

Class 351.—Large Black Breeding Sows, born in or before 1930.

- 2452 I.—THE MARQUESS OF AILESBUURY, Savernake Forest, Marlborough, for Baydon Nightingale 59th E. 1246, born Sept. 24, 1923, farrowed Feb. 6, bred by W. W. Woolland, Baydon Manor, Ramsbury; s. Kibbear Royal Prior 4th A. 1225, d. Baydon Nightingale 22nd C. 8098 by Valley General 2nd 25401.
 2469 II.—FRANK SAINSBURY, Blunts Hall, Little Wratting, Haverhill, for Kedington Constance 18th D. 2468, born Aug. 1, 1927, farrowed Jan. 13; s. Kedington Brigand C. 568, d. Kedington Constance 2nd 128718 by Ashby Lex 24747.
 2464 III.—W. W. WOOLLAND, Baydon Manor, Ramsbury, Marlborough, for Baydon Nightingale 59th F. 1204, born Aug. 26, 1929, farrowed Feb. 11; s. Baydon Prior 5th E. 881, d. Baydon Nightingale 52nd E. 162 by Valley General 2nd 25401.
 2459 IV.—JOHN A. LAWFORD, Heronsdale Manor, Waldron, Sussex, for Broyle Lavinia 1st G. 182, born Jan. 5, 1930, farrowed March 11; s. Treluckey Warrior 2nd C. 995, d. Broyle Nymph 1st A. 5154 by Arran Dandy 81159.
 2457 R.N.—D. W. P. GOUGH, Pakenham Manor, Bury St. Edmunds, for Fowlmire Fancy 25th.
 C.—2461.

Class 352.—Large Black Sows, born in 1931, before July 1.

- 2467 I. & R.N. for Champion.²—D. W. P. GOUGH, Pakenham Manor, Bury St. Edmunds, for Fowlmire Fancy 45th H. 516, born March 4, bred by W. C. Jackson, Fowlmire, Royston; s. Bardolph Night Boy E. 417, d. Fowlmire Fancy B. 1960 by Basingbourn Mac 30701.

¹ Prizes given by the Large Black Pig Society.

² Silver Challenge Cup, and Gold Medal to the Breeder, given by the Large Black Pig Society for the best Sow.

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- 2478 II.—R. HELLIER SMITH, West Newton, Bridgwater, for West Newton Princess 4th H. 208, born Feb. 25; s. Valley Accommodation D. 801, d. West Newton Princess D. 1816 by Kibbear Royal Prior 4th A. 1225.
 2469 III.—T. F. JAMES, Chantersluer Farm, Norwood Hill, Horley, for Treluckey Lady 26th H. 6, born Jan. 11; s. Valley Cheerio E. 511, d. Treluckey Lady 11th C. 2810 by Treluckey Pedestrian 1st B. 188.
 2465 IV.—THE EARL OF DARTMOUTH, K.C.B., Patshull House, Wolverhampton, for Patshull Bangle 24th H. 1276, born May 14; s. Tinten Leader C. 849, d. Patshull Bangle 19th E. 448 by Patshull Prince 1st B. 405.
 2466 R.N.—FRANK W. GILBERT, The Manor, Chellaston, Derby, for Chellaston Patience 10th.
 H.C.—2470. C.—2472.

Class 353.—Large Black Sows, born in 1931, on or after July 1.

- 2482 I.—R. GYNN & SON, Treslay, Boscastle, Cornwall; for Treslay Bess 11th H. 1116, born July 2; s. Tregirls Padstonian D. 578, d. Treslay Lass 11th F. 1446 by Hendra Sunstar D. 5.
 2479 II.—CAPT. J. CAMERON-SMITH, Teagues, Scaynes Hill, Haywards Heath, for Bassingbourn Black Bess 6th H. 294, born July 2, bred by Alfred Playle, Bassingbourn, Cambs.; s. Pakenham Lucrative G. 283, d. Fowlmere Black Bess 18th G. 688 by Bardolph Night Boy E. 417.
 2483 III.—JOHN A. LAWFORD, Heronsdale Manor, Waldron, Sussex, for Broyle Royal Queen 1st H. 1160, born Aug. 8; s. Treveglis Felix 4th G. 5, d. Broyle Souriya 1st F. 152 by Treluckey Warrior 2nd C. 995.
 2486 IV.—GEOFFREY G. MYATT, Beechcroft, Kilminster, Axminster, for Kilminster Queen 5th H. 1096, born Aug. 28; s. Kibbear Royal Prior 5th C. 119, d. Kilminster Lady L. F. 1112 by Kibbear Royal Henry 1st D. 679.
 2477 R.N.—W. J. ACREMAN, Langland Farm, Catcott, Bridgwater, for Luson Lady.
 H.G.—2481. C.—2485.

Class 354.—Large Black Sow, born in 1932.

- 2498 I. & Champion.—JOHN H. GLOVER, Cornwood, Devon, for Cornwood Lass 103rd K. 2, born Jan. 8; s. West Newton Premier G. 355, d. Cornwood Lass 101st G. 1734 by Patshull Monarch 1st D. 425.
 2508 II.—CAPT. D. M. WILLS, Barley Wood, Wrington, Somerset, for Barleywood Seniorita 36th K. 156, born Jan. 2; s. Brackenhill Duke 1st G. 349, d. Barleywood Seniorita 85th G. 2458 by Oadby Punch D. 17.
 2494 III.—D. W. P. GOUGH, Pakenham Manor, Bury St. Edmunds, for Pakenham Echo 2nd K. 82, born Jan. 11; s. Yam Esk 2nd F. 129, d. Pakenham Moonbeam 2nd E. 14 by Drayton Proconsul C. 985.
 2498 IV.—GEOFFREY G. MYATT, Beechcroft, Kilminster, Axminster, for Kilminster Queen 6th K. 4, born Jan. 3; s. Kibbear Royal Prior 5th C. 119, d. Kilminster Queen 4th F. 52 by Kibbear Royal Prior 7th C. 1181.
 2502 V.—WALTER J. WARREN, Deacons Farm, Staplegrave, Taunton, for Kibbear Royal Princess 1st K. 22, born Jan. 3; s. Kibbear Royal Prior 5th C. 119, d. Kibbear Lady Friend G. 972 by Kilminster Royal Laddie F. 387.
 2495 R.N.—R. GYNN & SON, Treslay, Boscastle, Cornwall, for Treslay Bess 15th.
 H.G.—2496. C.—2490.

Gloucestershire Old Spots.

Class 355.—Gloucestershire Old Spots Boars, born in or before 1930.

- 2506 I., Champion,¹ & R.N. for Champion.²—SHERRIFF & SONS, Lemsford, Welwyn Garden, Herts., for Hempstead Jim 17th 5888, born May 20, 1920, bred by W. T. and A. G. Bailey, Grist House, Hemel Hempstead; s. Hempstead Jim 12th 5808, d. Hempstead Daphne 21st 2047 by Hempstead General 5498.
 2507 II.—J. F. WRIGHT, Olton Farm, Solihull, for Solihull Bob 5914, born May 4, 1930; Solihull Buster 5353, d. Solihull Bonetta Z. 385 by Maiden Bradley Submarine 2nd 5720.

Class 356.—Gloucestershire Old Spots Boars, born in 1931.⁴

- 2510 I. & R.N. for Champion.¹—SHERRIFF & SONS, Lemsford, Welwyn Garden, Herts., for Nashes Duke 21st 5976, born Aug. 6; s. Pevensey Hero 5820, d. Nashes Duchess 44th Z. 439 by Hempstead Spot 5619.

¹ Silver Challenge Cup, and Gold Medal to the Breeder, given by the Large Black Pig Society for the best Sow.

² Silver Challenge Cup given through the Gloucestershire Old Spots Pig Society for the best Boar.

³ Perpetual Silver Challenge Cup given through the Gloucestershire Old Spots Pig Society for the best Gloucestershire Old Spots Pig.

⁴ Prizes given by the Gloucestershire Old Spots Pig Society.

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- 2508 II.—H. R. McCracken, Beara Farm, Pilton, Barnstaple, for Beara Scarmouche 5940, born Feb. 8; s. Thornbury Bandage 5804, d. Beara Sauce Z. 425 by Ashford June Lad 5760.
 2509 III.—SHERRIFF & SONS, for Nashes Bruce 6th 5971, born July 4; s. Hempstead Jim 17th 5888, d. Nashes Blossom 28th 2535 by Holmwood Wright 5857.
 2511 R.N.—J. F. WRIGHT, Olton Farm, Solihull, for Solihull Billy.

Class 357.—Gloucestershire Old Spots Boars, born in 1932.

- 2515 I.—J. F. WRIGHT, Olton Farm, Solihull, for Solihull Boxer 5979, born Feb. 2; s. Solihull Bob 5915, d. Solihull Josephine 12th Z. 605 by Holmwood Lillywhite 5th 5869.
 2518 II.—SHERRIFF & SONS, Lemsford, Welwyn Garden, Herts., for Nashes Duke 22nd 5977, born Jan. 5; Solihull Peter 5946, d. Nashes Duchess 49th Z. 631 by Hempstead Spot 5819.
 2514 III.—J. F. WRIGHT, for Solihull Bonner 5978, born Feb. 2; s. Solihull Bob 5915, d. Solihull Josephine 12th Z. 605 by Holmwood Lillywhite 5th 5869.
 2512 R.N.—H. R. McCracken, Beara Farm, Pilton, Barnstaple, for Solihull Jack.

Class 358.—Gloucestershire Old Spots Breeding Sows, born in or before 1930.

- 2517 I, Champion,¹ & Champion.²—H. R. McCracken, Beara Farm, Pilton, Barnstaple, for Beara Sauce Z. 425, born Aug. 16, 1928, farrowed Feb. 1; s. Ashford June Lad 5760, d. Maiden Bradley Stylish 6th Z. 151 by Thornbury Bison 5554.
 2518 II.—SHERRIFF & SONS, Lemsford, Welwyn Garden, Herts., for Nashes Duchess 49th Z. 631, born July 5, 1930, farrowed Jan. 5; s. Hempstead Spot 5619, d. Nashes Duchess 40th Z. 278 by Eastcott Defiance 5007.
 2519 III.—SHERRIFF & SONS, for Nashes Duchess 50th Z. 632, born May 4, 1930, farrowed Jan. 24; s. Pevensey Hero 5820, d. Nashes Duchess 44th Z. 493 by Hempstead Spot 5619.
 2520 R.N.—J. F. WRIGHT, Olton Farm, Solihull, for Solihull Josephine 12th.

Class 359.—Gloucestershire Old Spots Sows, born in 1931.

- 2524¹ I. & R.N. for Champion.²—J. F. WRIGHT, Olton Farm, Solihull, for Solihull Bonetta 2nd Z. 692, born July 3; s. Knowle Billy 5887, d. Solihull Bonetta Z. 585 by Maiden Bradley Submarine 2nd 5720.
 2523 II.—SHERRIFF & SONS, Lemsford, Welwyn Garden, Herts., for Nashes Blossom 80th Z. 737, born July 4; s. Hempstead Jim 17th Z. 5888, d. Nashes Blossom 28th Z. 535 by Holmwood Wight 5857.
 2521 III.—MAJOR R. F. FULLER, Great Chalfield, Melksham, for Chalfield Blossom 11th Z. 717, born March 4; s. Beara Michael 5867, d. Chalfield Blossom 7th Z. 588 by Maiden Bradley Judge 2nd 5825.
 2525 R.N.—J. F. WRIGHT, for Solihull Susan 13th.

Class 360.—Gloucestershire Old Spots Sows, born in 1932.

- 2526 I.—SHERRIFF & SONS, Lemsford, Welwyn Garden, Herts., for Nashes Duchess 54th Z. 739, born Jan. 5; s. Solihull Peter 5936, d. Nashes Duchess 49th Z. 631 by Hempstead Spot 5619.
 2530 II.—J. F. WRIGHT, Olton Farm, Solihull, for Solihull Josephine 16th Z. 741, born Feb. 2; s. Solihull Bob 5915, d. Solihull Josephine 12th Z. 605 by Holmwood Lillywhite 5th 5869.
 2527 III.—SHERRIFF & SONS, for Nashes Duchess 53rd Z. 738, born Jan. 5; s. Solihull Peter 5936, d. Nashes Duchess 49th Z. 631 by Hempstead Spot 5619.
 2529 R.N.—J. F. WRIGHT, for Solihull Josephine 14th.

Essex.

Class 361.—Essex Boars, born in or before 1930.

- 2532 I.—F. J. BOSWORTH, Greens Farm, Magdalen Laver, Ongar, for Barling Judge 5828 (486), born Jan. 27, 1930, bred by Kemley & Kemley, Shoeburyness; s. Cressing Jay 7th 5487, d. Barling Trustful 19602 by Pan Ernest 2693.
 2531 II.—H. S. ASHTON, Trueloves, Ingatstone, for Cherry of Trueloves 8679 (412), born Jan. 16, 1930, bred by F. J. Bosworth, Greens Farm, Magdalen Laver, Ongar; s. Pan Peacock 8601, d. Laver Lively 19958 by Thorley Drummer 3409.
 2533 III.—J. R. TINNEY, Church End, Rickling, Newport, Essex, for Roothing Kaiser 6th 8631 (418), born Jan. 2, 1930, bred by W. Ritchie, Margaret Roding, Dunmow; s. Beauchamp Kaiser 1st 8568, d. Roothing Lilac 2nd 18058 by Copyhold Generosity 2nd 2841.

¹ Perpetual Silver Challenge Cup given through the Gloucestershire Old Spots Pig Society for the best Gloucestershire Old Spots Pig.

² Perpetual Silver Challenge Cup given through the Gloucestershire Old Spots Pig Society for the best Sow.

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Class 362.—*Essex Boars, born in 1931.*

- 2537 I.—J. R. TINNEY, Church End, Rickling, Newport, Essex, for *Cressing Grand Duke* 8th 3915 (529), born Jan. 12, bred by A. J. Cousins, Cressing Lodge, Braintree; s. Laver Peacock 3689, d. Cressing Grand Duchess 2nd 20362 by Cressing Jay 5th 3437.
 2538 II.—WM. RITCHIE, Marks Hall, Margaret Roding, Dunmow, for *Trueloves Atom* 3847 (498), born Jan. 3, bred by H. S. Ashton, Trueloves, Ingatestone; s. Barling Neptune 3261, d. Trueloves Light 18404 by Barling Governor 2493.
 2539 III.—WM. RITCHIE, for *Trueloves Apricot* 3851 (500), born Jan. 2, bred by H. S. Ashton, Trueloves, Ingatestone; s. Cherry of Trueloves 3879, d. Trueloves Leaf 18640 by Rickling Angus 1st 3015.

Class 363.—*Essex Boars, born in 1932.*

- 2541 I. & R.N. for *Champion*.¹—WM. RITCHIE, Marks Hall, Margaret Roding, Dunmow, for *Roothing Sultan* 3rd 3983 (563), born Jan. 1; s. Benningtons Sultan 3795, d. Roothing Lilac 6th 20902 by Rickling Duke 4th 3581.
 2540 II.—WM. RITCHIE, for *Roothing Biddy* 10th 20914 by Rickling Duke 4th 3581.
 2539 III.—F. J. BOSWORTH, Greens Farm, Magdalen Laver, Ongar, for *Laver Judge* 3987 (565), born Jan. 20; s. Barling Judge 3823, d. Laver Gudgeon 18706 by Rickling Angus 8th 3139.
 2538 R.N.—H. S. ASHTON, Trueloves, Ingatestone, for *Trueloves Abrupt*.

Class 364.—*Essex Breeding Sows, born in or before 1930.*

- 2543 I.—J. R. TINNEY, Church End, Rickling, Newport, Essex, for *Rickling Charlotte* 27th 20804 (2353), born March 20, 1930, farrowed Jan. 1; s. Peadowns Gay Lad 1st 3327, d. Rickling Charlotte 25th 19938 by Cressing Angus 4th 1985.
 2544 II.—J. R. TINNEY, for *Rickling Empress* 20th 19934 (1910), born Feb. 22, 1929, farrowed Jan. 3; s. Barling Cadet 2797, d. Rickling Empress 16th 19772 by Cressing Angus 4th 1985.

Class 365.—*Essex Sows, born in 1931.*²

- 2545 I & *Champion*.¹—H. S. ASHTON, Trueloves, Ingatestone, for *Trueloves Artisan* 20788 (2345), born Jan. 4; s. Barling Neptune 3261, d. Trueloves Madness 19528 by Roothing Laughter 18th 3209.
 2549 II.—J. R. TINNEY, Church End, Rickling, Newport, Essex, for *Thorley Pippin* 6th 21210 (2553), born Aug. 23, bred by the Exors. of J. Tinney, Thorley Hall, Bishop's Stortford; s. Galleywood Mac 2nd 3365, d. Thorley Pippin 2nd 19530 by Rickling Angus 10th 3351.
 2546 III.—H. S. ASHTON, for *Trueloves Attract* 20772 (2337), born Jan. 4; s. Barling Neptune 3261, d. Trueloves Madly 19518 by Roothing Laughter 18th 3209.
 2548 R.N.—WM. RITCHIE, Marks Hall, Margaret Roding, Dunmow, for *Roothing Biddy* 12th.
 H.C.—2547.

Class 366.—*Essex Sows, born in 1932.*

- 2552 I.—F. J. BOSWORTH, Greens Farm, Magdalen Laver, Ongar, for *Laver Cat* 21272 (2591), born Jan. 19; s. Barling Judge 3823, d. Laver Buckle 20608 by Thorley Drummer 3409.
 2556 II.—J. R. TINNEY, Church End, Rickling, Newport, Essex, for *Rickling Empress* 2nd 21212 (1921), born Jan. 3; s. Roothing Kaiser 5th 3681, d. Rickling Empress 20th 19984 by Barling Cadet 2797.
 2555 III.—WM. RITCHIE, Marks Hall, Margaret Roding, Dunmow, for *Roothing Lilac* 18th 21270 (2590), born Jan. 9; s. Benningtons Sultan 3795, d. Roothing Lilac 3rd 18080 by Copyhold Generosity 2nd 2341.
 2554 R.N.—WM. RITCHIE, for *Roothing Biddy* 14th.
 H.C.—2553. C.—2551.

Long White Lop-eared.

Class 367.—*Long White Lop-Eared Boars, born in or before 1930.*

- 2553 I., *Champion*,³ & *Champion*.⁴—G. H. EVSRICK, Beaurrell, Gwinear, Hayle, for *Afton Gay Boy* 1122, born Jan. 15, 1926, bred by Pearce & Sons, Afton, Totnes; s. Yealmpstone Sunday 553, d. Coryton Beauty 2683 by Coryton General 532.
 2560 II.—W. H. NEAL, Walreddon Farm, Tavistock, for *Ipplepen Forester* 2156, born July 13, 1930, bred by M. H. Moore, Ipplepen, Devon; s. Yealmpstone Sambo 1798, d. Ipplepen Pride 4th 6169 by Lumburn Leader 2nd 1464.

¹ Champion Silver Cup given by the Essex Pig Society for the best Essex Pig.

² Prizes given by the Essex Pig Society.

³ Champion Silver Medal given by the National Long White Lop-Eared Pig Society for the best Boar.

⁴ The "Risingholme" Silver Challenge Cup given through the National Long White Lop-Eared Pig Society for the best Long White Lop-Eared Pig.

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- 2557 III.—DARTINGTON HALL, LTD., Clifford Bridge Farm, Drewsteignton, Exeter, for Ipplepen Hopeful 2108, born Dec. 20, 1929, bred by M. H. Moore, Ipplepen, Devon; s. Yealmpstone Sambo 1796, d. Ipplepen Belle 5421 by Axworthy Captain 1870.
2561 R.N.—CAPT. D. M. WILLS, Barley Wood, Wrington, Somerset, for Ipplepen Don 2nd.

Class 368.—Long White Lop-Eared Boars, born in 1931.

- 2564 I. & R.N. for Champion.¹—T. C. MARSHALL, Paramount, Ivybridge, for Paramount Duke 2292, born Jan. 12; s. Paramount Superior 2nd 2194, d. Devonshire Royal Duchess 6567 by Devonshire Ladder 1880.
2565 II.—WM. J. WESTLAKE, Godwell, Ivybridge, for Wiverton Don 1st 2384, born March 4, bred by I. H. Westlake, Wiverton, Plympton; s. Ipplepen Don 2nd 2150, d. Godwell Beauty 23rd 5905 by Godwell Sultan 1114.
2568 III.—G. H. EUSTICE, Bezurrell, Gwinear, Hayle, for Bezurrell Bacon Boy 32nd, 2468, born Aug. 25; s. Afton Gay Boy 1122, d. Bezurrell Mary 25th 6483 by Bezurrell Hero 1st 1690.

Class 369.—Long White Lop-Eared Boars, born in 1932.

- 2571 I.—W. H. NEAL, Walreddon Farm, Tavistock, for Godwell Moonshine 6th 2482, born Jan. 3, bred by W. J. Westlake, Godwell Farm, Ivybridge; s. Devonshire Sportsman 2108, d. Godwell Gem 2nd 6165 by Ipplepen Don 1812.
2572 II.—W. J. WESTLAKE, Godwell, Ivybridge, for Godwell Moonshine 7th 2498, born Jan. 8; s. Devonshire Sportsman 2108, d. Godwell Gem 2nd 6165 by Ipplepen Don 1812.
2567 III.—DARTINGTON HALL, LTD., Clifford Bridge Farm, Drewsteignton, Exeter, for Clifford Bohemian 2478, born Jan. 6; s. Prestow Rover 2190, d. Clifford Attraction 6769 by Ipplepen Hopeful 2106.
2570 R.N.—T. C. MARSHALL, Paramount, Ivybridge, for Paramount Duke 2nd.

Class 370.—Long White Lop-Eared Breeding Sows, born in or before 1930.

- 2580 I., R.N. for Champion,² & Champion.³—W. J. WESTLAKE, Godwell, Ivybridge, for Wiverton Dawn 6497, born Feb. 5, 1930, farrowed Jan. 2, bred by I. H. Westlake, Wiverton, Plympton; s. Folly Merryman 1420, d. Godwell Beauty 23rd 5905 by Godwell Sultan 1114.
2577 II.—T. C. MARSHALL, Paramount, Ivybridge, for Paramount Princess 5th 6305, born Jan. 4, 1930, farrowed Jan. 10; s. Devonshire Ladder 1880, d. Colwell Princess 4th 5859 by Lukesland Hero 342.
2579 III.—W. H. NEAL, Walreddon Farm, Tavistock, for Larcombe Butterfly 1st 5721, born Jan. 20, 1928, farrowed Feb. 17, bred by Mrs. E. Baker, Larcombe, Blackawton, Totnes; s. Ipplepen Don 1812, d. Godwell Butterfly 6th 4351 by Yealmpstone Ben 3rd 988.
2574 R.N.—FRED J. BAKER, Shute, Salcombe, Devon, for Larcombe Butterfly 5th.

Class 371.—Long White Lop-Eared Sows, born in 1931.⁴

- 2581 I. & R.N. for Champion.⁵—DARTINGTON HALL, LTD., Clifford Bridge Farm, Drewsteignton, Exeter, for Clifford Attraction 6769, born Jan. 10; s. Ipplepen Hopeful 2106, d. Lidcutt Vanity 2nd 6857 by Lumburn Lad 5th 1782.
2586 II.—W. H. NEAL, Walreddon Farm, Tavistock, for Yealmpstone Beauty 2nd 6747, born Jan. 15; s. Yealmpstone Gay Boy 3rd 1992, d. Godwell Beauty 5th 4359 by Yealmpstone Ben 3rd 988.
2582 III.—G. H. EUSTICE, Bezurrell, Gwinear, Hayle, for Bezurrell Alacrity 16th 6745, born Jan. 8; s. Priory Millman 11th 2078, d. Bezurrell Alacrity 5th 5851 by Afton Gay Boy 1122.
2588 R.N.—G. H. EUSTICE, for Bezurrell Lily 8th.

Class 372.—Long White Lop-Eared Sows, born in 1932.

- 2593 I.—CAPT. D. M. WILLS, Barley Wood, Wrington, Somerset, for Prestow Rhoda 15th 7117, born Jan. 1; s. Ipplepen Don 2nd 2150, d. Prestow Rhoda 1st 5991 by Lumburn Millman 1194.
2591 II.—W. H. NEAL, Walreddon Farm, Tavistock, for Yealmpstone Gem 7087, born Feb. 8; s. Treringley Ben 2072, d. Godwell Beauty 8th 4359 by Yealmpstone Ben 3rd 988.
2588 III.—G. H. EUSTICE, Bezurrell, Gwinear, Hayle, for Bezurrell Mary 29th 7088, born Jan. 8; s. Afton Gay Boy 1122, d. Bezurrell Mary 16th 6185 by Bezurrell Hero 1st 1690.
2587 R.N.—DARTINGTON HALL, LTD., Clifford Bridge Farm, Drewsteignton, Exeter, for Clifford Blonde.

¹ Champion Silver Medal given by the National Long White Lop-Eared Pig Society for the best Boar.

² The "Risingholme" Silver Challenge Cup given through the National Long White Lop-Eared Pig Society for the best Long White Lop-Eared Pig.

³ Champion Silver Medal given by the National Long White Lop-Eared Pig Society for the best Sow.

⁴ Prizes given by the National Long White Lop-Eared Pig Society.

POULTRY.

By "Cook" and "Hen" are meant birds hatched previous to January 1, 1932; and by "Cockerel" and "Pullet" are meant birds hatched in 1932.

The Prizes in each Class are as follows: First Prize, 30s.; Second Prize, 20s.; Third Prize, 10s.; Fourth Prize, 5s.

Special Prizes were given in the Poultry Classes by the following Clubs: Croad Langshan, Sussex, Columbian Wyandotte, Buff Orpington, British Black Barnevelder, British Barnevelder, Welsummer, and Rhode Island Red.
"P.F." stands for "Poultry Farm."

Class 373.—*Dorking Cocks or Cockerels.*

- 1 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
- 4 II.—SAMUEL OATEY, Chacewater, Truro.
- 2 III. and 5 IV.—A. J. MAJOR, Ditton, Langley, Bucks.
- 3 E.N.—ABBOT BROS., Thuxton, Norfolk.

Class 374.—*Dorking Hens or Pullets.*

- 8 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
- 11 II.—W. R. OATEY, 21, Richmond Hill, Truro.
- 7 III.—A. J. MAJOR, Ditton, Langley, Bucks.
- 6 IV.—MRS. EMILY MILLS, Woodford Hall, Milton Damarel, Devon.
- 9 E.N.—SAMUEL OATEY, Chacewater, Truro.
- H.C.—10.

Class 375.—*Croad Langshan Cocks or Cockerels.*

- 12 I. & Special.—HAROLD CHURCH, Godshill, Fordingbridge, Hants.
- 25 II. & E.N. for Special.—R. ANTHONY, Euxton, Chorley, Lancs.
- 15 III.—DR. W. P. GRELLET, Orford Lodge, Hitchin, Herts.
- 19 IV.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
- 14 E.N.—C. F. BARKER, 51, Waverley, Brays Lane, Coventry.
- H.C.—22. C.—17.

Class 376.—*Croad Langshan Hens or Pullets.*

- 89 I. & Special.—R. ANTHONY, Euxton, Chorley, Lancs.
- 30 II. & E.N. for Special and 85 III.—HAROLD CHURCH, Godshill, Fordingbridge, Hants.
- 28 IV and 31 E.N.—MRS. EMILY MILLS, Woodford Hall, Milton Damarel, Devon.
- H.C.—27. C.—82.

Class 377.—*Brahma or Cochín Cocks or Cockerels.*

- 43 I.—R. ANTHONY, Euxton, Chorley, Lancs.
- 41 II.—COL. R. S. WILLIAMSON, The Grange, Rawnsley, Stafford.
- 42 III.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.

Class 378.—*Brahma or Cochín Hens or Pullets.*

- 48 I.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.
- 47 II.—R. ANTHONY, Euxton, Chorley, Lancs.
- 49 III.—MRS. A. M. HALL, The Gables, Ruyton-XI-Towns, Shrewsbury.
- 51 IV.—H. HOUGH-WATSON, Braystones House, Beckermest, Cumberland.
- 53 E.N.—ROBIN JACKSON, Garden Park, Ayr.
- H.C.—52. C.—46.

Class 379.—*Red Sussex Cocks.*

- 56 I., 59 II. and 54 III.—J. DUMBLETON, Sheen Croft Farm, Didcot, Berks.
- 55 IV.—CHAS. HARDY, Argos Hill, Rotherfield, Sussex.
- 57 E.N.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
- H.C.—58.

Class 380.—*Red Sussex Hens.*

- 63 I. & E.N. for Special, 61 II. and 65 E.N.—J. DUMBLETON, Sheen Croft Farm, Didcot.
- 62 III.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
- 60 IV.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
- H.C.—64.

Class 381.—*Red Sussex Cockerels.*

- 69 I. & Special, 66 II. and 63 III.—J. DUMBLETON, Sheen Croft Farm, Didcot, Berks.
- 67 IV.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.

Class 382.—Red Sussex Pullets.

- 70 I., 78 II. and 72 III.—J. DUMBLETON, Sheen Croft Farm, Didecot, Berks.
71 IV.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.

Class 383.—Light Sussex Cocks.

- 74 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
80 II.—MISS M. V. LARKWORTHY, Cooper's Bridge, Liphook, Hants.
81 III. and 77 IV.—HENRY UNDERWOOD, Mowshurst P.F., Edenbridge.
79 R.N.—CARL HOLMES, Clover Top Farm, Codicote, Hitchin.
H.C.—76. C.—78.

Class 384.—Light Sussex Hens.

- 85 I.—CARL HOLMES, Clover Top Farm, Codicote, Hitchin.
83 II., 90 III. and 87 R.N.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
86 IV.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
H.C.—89. C.—84.

Class 385.—Light Sussex Cockerels.

- 92 I., Special & Cup,¹ and 90 II.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
91 III.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
94 IV.—J. ONSLOW FANE, Stevenon Manor, Hants.
93 R.N.—HENRY UNDERWOOD, Mowshurst P.F., Edenbridge.
H.C.—97. C.—100.

Class 386.—Light Sussex Pullets.

- 108 I., R.N. for Special, & R.N. for Cup,¹ and 101 II.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
105 III.—COL. D. A. CHAYTOR, Pooley Hall, Polesworth, Tamworth.
109 IV.—HENRY UNDERWOOD, Mowshurst P.F., Edenbridge.
103 R.N.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
H.C.—102. C.—104.

Class 387.—Speckled Sussex Cocks.

- 111 I. and 118 II.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
110 III.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey, Hants.

Class 388.—Speckled Sussex Hens.

- 117 I. & Special and 115 III.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
116 II.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey, Hants.

Class 389.—Speckled Sussex Cockerels.

- 119 I. & R.N. for Special, 120 II. and 121 III.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.

Class 390.—Speckled Sussex Pullets.

- 127 I., 125 III. and 123 IV.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
124 II.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey, Hants.
126 R.N.—HENRY UNDERWOOD, Mowshurst P.F., Edenbridge.
C.—122.

Class 393.—Buff Sussex Cocks or Cockerels.

- 182 I. & Special, 180 II. & R.N. for Special and 128 III.—E. CRUTTENDEN, Lattenbury, Hellingly, Sussex.
181 IV.—ARTHUR COOKE, Creamhaven, 25, Halmersgate, Spalding.
129 R.N.—MISS M. G. NEWMAN, High Hurstwood, Uckfield.

Class 395.—White Sussex Cocks or Cockerels.

- 186 I. & R.N. for Special and 183 II.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
185 III.—CARL HOLMES, Clover Top Farm, Codicote, Hitchin.
184 IV.—FRANCIS J. MARSTON, Biddenden P.F., Kent.

¹ The "Crawshay Memorial" Cup and a Special Prize given through the Sussex Poultry Club for the best Light Sussex.

Class 396.—White Sussex Hens or Pullets.

- 139 I. & Special and 141 II.—CARL HOLMES, Clover Top Farm, Codicote, Hitchin.
187 III. and 140 IV.—FRANCIS J. MARSTON, Biddenden P.F., Kent.
138 R.N.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
H.C.—142.

Class 397.—White Wyandotte Cocks or Cockerels.

- 144 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
147 II.—R. ANTHONY, Euxton, Chorley, Lancs.
145 III.—MISS M. V. LARKWORTHY, Cooper's Bridge, Liphook, Hants.
148 IV.—JOHN BARTON, Burtree House, Hutton Sessay, Thirsk.
146 R.N.—H. AYS COUGH THOMPSON, Rosemead, Potters Bar.

Class 398.—White Wyandotte Hens or Pullets.

- 153 I.—R. ANTHONY, Euxton, Chorley, Lancs.
152 II.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
150 III.—MISS M. V. LARKWORTHY, Cooper's Bridge, Liphook, Hants.
151 IV.—JOHN BARTON, Burtree House, Hutton Sessay, Thirsk.
149 R.N.—J. CARLTON HUNTING, Pankridge Farm, Prestwood, Great Missenden.

Class 399.—Gold or Silver Laced Wyandotte Cocks or Cockerels.

- 157 I. and 154 II.—JAMES H. SMITH, Peet's Farm, Southport.
156 III.—WM. RICHARDSON, 40, Bootham Crescent, York.

Class 400.—Gold or Silver Laced Wyandotte Hens or Pullets.

- 158 I. and 162 III.—E. H. KNAPMAN, Vale View, Wincanton.
161 II.—F. W. TURNER, Southbank, Bucknall, Stoke-on-Trent.

Class 401.—Columbian Wyandotte Cocks or Cockerels.

- 166 I. & Cup.¹—W. A. SLOCOCK, Goldsworth Orchard, St. John, Woking.
165 II.—R. MATTERFACE, 121, South Street, Bridport.
164 III. and 167 IV.—FRED BROWN, Woodside, Grimscars, Huddersfield.

Class 402.—Columbian Wyandotte Hens or Pullets.

- 173 I. & R.N. for Cup¹ & Spoon.¹—R. MATTERFACE, 121, South Street, Bridport.
168 II. & R.N. for Spoon.¹—M. BEWLEY, Home Farm, Carleton, Penrith.
171 III.—W. A. SLOCOCK, Goldsworth Orchard, St. John, Woking.
170 IV.—FRED BROWN, Woodside, Grimscars, Huddersfield.
177 R.N.—J. DICKINSON & SON, Grove House, Headcorn, Ashford, Kent.

Class 403.—Wyandotte Cocks or Cockerels, any other colour.

- 178 I.—ROGER HARGREAVES, Abbeydene P.F., Whalley, Lancs.
181 II. and 184 III.—J. G. MORTEN, Pentrich, Derby.
182 IV.—JAMES MELLOR, Tunstead, Wormhill, Buxton.

Class 404.—Wyandotte Hens or Pullets, any other colour.

- 188 I.—ROGER HARGREAVES, Abbeydene P.F., Whalley, Lancs.
186 II.—J. CARLTON HUNTING, Pankridge Farm, Prestwood, Great Missenden.
191 III.—T. ASHCROFT, Wyverne, New Longton, Preston.
189 IV.—HERBERT HILL, 14, Partlands Avenue, Ryde, Isle of Wight.
190 R.N.—H. & N. GRIMSHAW, Little Browns Farm, Edenbridge.

Class 405.—Buff Orpington Cocks or Cockerels.

- 194 I. & Special, 192 II. & R.N. for Special and 195 IV.—THOMAS E. HALLIDAY, 28 Florence Road, Sanderstead, Surrey.
193 III.—L. LINLEY, Plough Lane, Lowdham, Notts.

Class 407.—Black Orpington Cocks or Cockerels.

- 200 I. and 196 II.—JOHN BURDETT, Lake Bank Terrace, Wingate, Co. Durham.
197 III. and 201 R.N.—A. J. HILLMAN, Othery, Bridgwater.
198 IV.—CAPT. E. DUCKWORTH, Corner Heys, Tinsley Green, Crawley.
H.C.—199.

¹ The "Goddard" Visiting Cup given by the Columbian Wyandotte Club for the best Columbian Wyandotte, and a Silver Spoon for the best Columbian Wyandotte of opposite sex.

Awards of Poultry Prizes at Southampton, 1932. cxliii

Class 409.—Orpington Cocks or Cockerels, any other colour.

- 208 I.—H. WHITLEY, Primley, Paignton, Devon.
 202 II., 204 IV. and 206 R.N.—WILLIAM FIELDEN, Watersmeet, Harnham, Salisbury.
 205 III.—E. & P. AINLEY, Ferndale P.F., Verandah Lodge, Horley.

Class 410.—Orpington Hens or Pullets, any other colour.

- 207 I.—R. ANTHONY, Euxton, Chorley, Lancs.
 211 II.—E. & P. AINLEY, Ferndale P.F., Verandah Lodge, Horley.
 210 III.—WILLIAM FIELDEN, Watersmeet, Harnham, Salisbury.
 208 IV.—H. WHITLEY, Primley, Paignton, Devon.
 209 R.N.—TOM TRIGG, The Oaks, Anthill, Denmead, Cosham.

Class 411.—Australorp Cocks or Cockerels.

- 218 I.—J. W. FAWCETT, 7, Mann Square, Thurnscoe, Rotherham.
 214 II.—MRS. E. K. STAINES, Hook Farm, Leigh, Reigate.
 218 III.—MRS. A. M. PAPE, Shrewton House P.F., Shrewton, Wilts.
 212 IV.—MRS. W. A. REEVES, Norton Ferris, Kilmington, Frome.
 217 R.N.—J. E. H. VENNING, Trefrank, St. Clether, Launceston.
 H.C.—215. C.—216.

Class 412.—Australorp Hens or Pullets.

- 227 I.—TOM GARDNER, Bowgrave, Garstang.
 223 II.—MRS. W. A. REEVES, Norton Ferris, Kilmington, Frome.
 221 III.—F. H. GILES, Dunkerry, Barkham Road, Wokingham.
 225 IV.—GEOFFREY F. HAZELL, Red House Farm, Hinton, Darsham, Suffolk.
 222 R.N.—J. E. H. VENNING, Trefrank, St. Clether, Launceston.
 H.C.—226. C.—224.

Class 413.—Black Barnevelder Cocks or Cockerels.

- 229 I. & Special.—EVENDON LODGE PEDIGREE P.F., Wokingham.
 235 II. & R.N. for Special.—MRS. HUNTINGTON, Wellesbourne House, Warwick.
 233 III.—RICHARD SALE, Clothall, Bury, Baldock.
 232 IV.—HARRY FOX, International Poultry Yards, Matlock.
 H.C.—230. C.—228.

Class 414.—Black Barnevelder Hens or Pullets.

- 240 I. & Special.—HARRY FOX, International Poultry Yards, Matlock.
 239 II. & R.N. for Special and 251 IV.—MRS. HUNTINGTON, Wellesbourne House, Warwick.
 249 III.—TOM CLOUGH, P.F., Gawsorth, Macclesfield.
 H.C.—247. C.—242.

Class 415.—Barnevelder Cock or Cockerel, any other colour.

- 257 I.—W. A. SLOCOCK, Goldsworth Orchard, St. John, Woking.
 255 II. and 259 IV.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.
 250 III.—J. E. COWCILL, Silkstone Main P.F., Silkstone Common, Barnsley.
 H.C.—260. C.—254.

Class 416.—Barnevelder Hens or Pullets, any other colour.

- 268 I. & Special and 268 II. & R.N. for Special.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.
 264 III.—J. H. BEEVER, Wansford, Driffield.
 267 IV.—J. E. COWCILL, Silkstone Main P.F., Silkstone Common, Barnsley.
 H.C.—266. C.—270.

Class 417.—Welsummer Cocks or Cockerels.

- 275 I. & Special.—F. RUSSELL, Leamington, Silkstone Common, Barnsley.
 286 II. & R.N. for Special.—GRELLET & Moss, 28, Lancaster Road, Hitchin.
 280 III.—ROGER HARGREAVES, Abbeydene P.F., Whalley, Lancs.
 274 IV.—EVENDON LODGE PEDIGREE P.F., Wokingham.
 H.C.—288. C.—287.

Class 418.—Welsummer Hens or Pullets.

- 302 I. & Special.—ROGER HARGREAVES, Abbeydene P.F., Whalley, Lancs.
 291 II. & R.N. for Special.—J. E. COWCILL, Silkstone Main P.F., Silkstone Common, Barnsley.
 299 III.—GRELLET & Moss, 28, Lancaster Road, Hitchin.
 306 IV.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.
 H.C.—293. C.—292.

Class 419.—Rhode Island Red Cocks.

- 324 I.—MRS. M. DOUGLAS, Croft Farm, Hessay, York.
 322 II.—G. H. MUZZLEWHITE, Redlands, Tavistock.
 313 III.—W. R. ABBEY & SON, Croft Farm, Hessay, York.
 319 IV.—FRANK H. PAGE, Woodlands, Great Horkesley, Colchester.
 H.C.—812, 818. C.—825.

Class 420.—Rhode Island Red Hens.

- 327 I.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey, Hants.
 328 II.—G. H. MUZZLEWHITE, Redlands, Tavistock.
 329 III.—FRANK H. PAGE, Woodlands, Great Horkesley, Colchester.
 326 IV.—W. R. ABBEY & SON, Croft Farm, Hessay, York.
 332 R.N.—MRS. M. DOUGLAS, Croft Farm, Hessay, York.
 H.C.—833. C.—835.

Class 421.—Rhode Island Red Cockerels.

- 340 I. & R.N. for Special.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey, Hants.
 345 II.—FRANK H. PAGE, Woodlands, Great Horkesley, Colchester.
 346 III.—JOHN DARNELL, Sunnymede, Rampton, Retford.
 344 IV.—W. R. ABBEY & SON, Croft Farm, Hessay, York.
 352 R.N.—CAPT. E. DUCKWORTH, Corner Heys, Tinsley Green, Crawley.
 H.C.—853, 854. C.—859.

Class 422.—Rhode Island Red Pullets.

- 366 I & Special.—G. H. MUZZLEWHITE, Redlands, Tavistock.
 358 II. and 371 III.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey.
 356 IV.—FRANK H. PAGE, Woodlands, Great Horkesley, Colchester.
 359 R.N.—CAPT. E. DUCKWORTH, Corner Heys, Tinsley Green, Crawley.
 H.C.—368, 372, 374. C.—360, 361, 362, 367.

Class 423.—Barred Plymouth Rock Cocks.

- 382 I.—W. W. W. BUTT, Eastfield P.F., North Thoresby, Lincs.
 389 II.—RICHARD CAPE, Armitage Lodge, Armitage, Staffs.
 380 III.—JOHN TAYLOR, Heath Farm, Tiptree, Essex.
 384 IV.—J. W. HAYTON, Levensfield, Silverdale, Lancs.
 388 R.N.—JOHN PENNINGTON, Heswall-on-Dee, Birkenhead.
 H.C.—387. C.—385.

Class 424.—Barred Plymouth Rock Hens.

- 395 I.—MRS. W. G. JACKA, Ninnis, Germoe, Marazion.
 392 II.—W. W. W. BUTT, Eastfield P.F., North Thoresby, Lincs.
 397 III.—EDWIN MARSHALL, 7, Gregory Street, Lenton, Nottingham.
 391 IV.—JOHN TAYLOR, Heath Farm, Tiptree, Essex.
 394 R.N.—JAMES H. SMITH, Peet's Farm, Southport.
 H.C.—390.

Class 425.—Barred Plymouth Rock Cockerels.

- 405 I.—J. FAWCETT, Eldron House, Ingleton, Yorks.
 400 II. and 403 IV.—RICHARD MAJOR, The Cross, Kirkby Lonsdale.
 401 III.—J. W. HAYTON, Levensfield, Silverdale, Lancs.
 398 R.N.—GEORGE WOODIWISS, Lindeth Lodge, Silverdale, Lancs.

Class 426.—Barred Plymouth Rock Pullets.

- 414 I.—J. FAWCETT, Eldron House, Ingleton, Yorks.
 407 II.—JOHN TAYLOR, Heath Farm, Tiptree, Essex.
 413 III.—JOHN PENNINGTON, Heswall-on-Dee, Birkenhead.
 406 IV.—H. GARLICK, Kirkby Lonsdale.
 403 R.N.—GEORGE WOODIWISS, Lindeth Lodge, Silverdale, Lancs.

Class 427.—Buff Plymouth Rock Cocks or Cockerels.

- 419 I.—W. W. W. BUTT, Eastfield P.F., North Thoresby, Lincs.
 421 II.—JOHN HEALEY, Kiln Bank, Croft, Market Drayton.
 416 III.—HOWARD PAGE, The Cedars, Great Horkesley, Colchester.
 420 IV. and 415 R.N.—MRS. J. H. DREW, Buff Rock P.F., Basingstoke.

Class 428.—Buff Plymouth Rock Hens or Pullets.

- 422 I. and 427 II.—JAMES BATEMAN, Milnthorpe.
 425 III.—JOHN TAYLOR, Heath Farm, Tiptree, Essex.
 426 IV. and 424 R.N.—Mrs. J. H. DREW, Buff Rock P.F., Basingstoke.
 H.C.—420. C.—423.

Class 429.—Plymouth Rock Cocks or Cockerels, any other colour.

- 436 I.—R. ANTHONY, Euxton, Chorley, Lancs.
 430 II.—W. R. ABBEY & SON, Croft Farm, Hessay, York.
 433 III.—JOHN TAYLOR, Heath Farm, Tiptree, Essex.
 432 IV.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.
 437 R.N.—RICHARD CAPE, Armitage Lodge, Armitage, Staffs.

Class 430.—Plymouth Rock Hens or Pullets, any other colour.

- 440 I.—W. R. ABBEY & SON, Croft Farm, Hessay, York.
 443 II.—JOHN TAYLOR, Heath Farm, Tiptree, Essex.
 439 III.—W. W. W. BUTT, Eastfield P.F., North Thoresby, Lincs.
 438 IV.—P. A. OLIVER, 170, Carisbrooke Road, Newport, Isle of Wight.
 441 R.N.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.

Class 431.—Old English Game Black-Red Cocks or Cockerels.

- 444 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
 447 II.—S. D. STANLEY-DODGSON, Armaside, Cockermouth.
 445 III.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield.
 448 IV.—JOHN JONES, The Laurels, Kendon, Crumlin, Mon.
 446 R.N.—A. SLATER, The Old Vicarage, Lythe, Whitby.

Class 432.—Old English Game Clay or Wheaten Hens or Pullets.

- 454 I.—JOHN JONES, The Laurels, Kendon, Crumlin, Mon.
 452 II.—A. SLATER, The Old Vicarage, Lythe, Whitby.
 440 III.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield.
 451 IV.—S. D. STANLEY-DODGSON, Armaside, Cockermouth.
 458 R.N.—J. H. BAKER & SON, Windyash, Barnstaple.
 H.C.—455. C.—450.

Class 433.—Old English Game Cocks or Cockerels, any other colour.

- 457 I.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield.
 462 II.—JOHN JONES, The Laurels, Kendon, Crumlin, Mon.
 461 III.—A. J. MAJOR, Ditton, Langley, Bucks.
 456 IV.—DR. W. E. BAKER, Hill Crest, Clitheroe.
 460 R.N.—A. SLATER, The Old Vicarage, Lythe, Whitby.

Class 434.—Old English Game Hens or Pullets, any other colour.

- 470 I. and 465 R.N.—A. SLATER, The Old Vicarage, Lythe, Whitby.
 467 II.—R. D. BLIGHT, Totnes.
 466 III.—DR. W. E. BAKER, Hill Crest, Clitheroe.
 464 IV.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield.
 H.C.—468.

Class 435.—Indian Game Cocks or Cockerels.

- 475 I.—J. H. BAKER & SON, Windyash, Barnstaple.
 471 II.—W. E. PLATTEN, Hill House, Little Ryburgh, Fakenham.
 473 III.—Mrs. A. C. SILK, Nutbourne, Chichester.
 474 IV.—W. G. BRENT, Warrens Park, Congdon Shop, Launceston.
 472 R.N.—CECIL BRENT, Clampit, Callington, Cornwall.

Class 436.—Minorca Hens or Pullets.

- 478 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
 481 II.—GOODMAN BROS., 10, Quantock Terrace, Bridgwater.
 476 III.—J. P. R. LE PREZ, St. Heliers, Rownhams Lane, Scragg Hill, Romsey.
 480 IV.—H. J. WEBB, Artichoke, Orpington, Kent.
 477 R.N.—S. E. PARKER, 466, Bloxwich Road, Leamore, Walsall.
 C.—479.

Class 439.—Leghorn Cocks or Cockerels, any colour.

- 484 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
 483 II.—R. ANTHONY, Euxton, Chorley, Lancs.
 486 III.—JOHN M. SHOTTON, Catchgate Farm, Castle Eden.
 487 IV.—R. W. KEEN, The Factory, Castle Eden.
 488 R.N.—W. G. ROGERS, Lynwood House, Globe Road, Romford.
 C.—485.

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Class 440.—Leghorn Hens or Pullets, any colour.

- 480 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
491 II.—R. ANTHONY, Euxton, Chorley, Lancs.
498 III.—H. V. MATTINGLEY, 138, Osborne Road, Portswood, Southampton.
490 IV.—MISS B. M. BROOMFIELD, Dunwood Beeches, Romsey, Hants.
H.C.—492.

Class 444.—Campine Hens or Pullets.

- 494 I. and 496 IV.—JOHN S. APPLETON, 70, Arden Street, Earlsdon, Coventry.
497 II. and 495 III.—W. A. SLOCOCK, Goldsworth Orchard, St. John, Woking.

Class 445.—Bresse Cocks or Cockerels, any colour.

- 499 I. and 501 IV.—ERNEST STEVENS, 55, The Oval, Godalming.
508 II.—MRS. W. A. REEVES, Norton Ferris, Kilmington, Frome.
500 III.—R. S. MARSDEN, Chatburn, Clitheroe.

Class 446.—Bresse Hens or Pullets, any colour.

- 504 I.—MRS. W. A. REEVES, Norton Ferris, Kilmington, Frome.
508 II. and 505 IV.—ERNEST STEVENS, 55, The Oval, Godalming.
502 III.—R. S. MARSDEN, Chatburn, Clitheroe.

Class 447.—White Silkie Cocks or Cockerels.

- 509 I.—MRS. FENTIMAN, Haldon, 188, Whitworth Road, Swindon.
508 II. and 512 III.—MRS. A. M. HALL, The Gables, Ruyton-XI-Towns, Shrewsbury.
511 IV.—THE MISSES DAVIDSON & CHISHOLM, Maisonette, Mont Cochon, Jersey.
H.C.—510. C.—507.

Class 448.—White Silkie Hens or Pullets.

- 516 I. and 514 II.—MRS. A. M. HALL, The Gables, Ruyton-XI-Towns, Shrewsbury.
517 III.—THE MISSES DAVIDSON & CHISHOLM, Maisonette, Mont Cochon, Jersey.
515 IV.—ROBERT L. FAIRLEY, Lahana, Whitehouse Road, Cramond Bridge.
H.C.—513.

Class 449.—Silkie Cocks, Cockerels, Hens or Pullets, any other colour.

- 521 I, 518 II. and 523 IV.—MASTER DAVID DRAPER, 99, Boundary Road, London, N.W.8.
522 III.—ROBERT L. FAIRLEY, Lahana, Whitehouse Road, Cramond Bridge.
H.C.—519. C.—520.

Class 450.—Cocks, any other distinct variety, except Bantams.

- 525 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead. Hamburg.
531 II.—JOHN JONES, The Laurels, Kendon, Crumlin, Mon. Modern Game.
529 III.—H. HOUGH-WATSON, Braystones House, Beckermat. Polish.
528 IV.—JAMES F. NEWTON, 159, Chichester Road, Northend, Portsmouth. Norfolk Grey.
527 R.N.—ABBOT BROS., Thuxton, Norfolk. Andalusian.
H.C.—524.

Class 451.—Hens, any other distinct variety, except Bantams.

- 538 I.—H. HOUGH-WATSON, Braystones House, Beckermat. Polish.
532 II.—A. J. MAJOR, Ditton, Langley, Bucks. Sooth Dumpie.
540 III.—JOHN JONES, The Laurels, Kendon, Crumlin, Mon. Modern Game.
537 IV.—ABBOT BROS., Thuxton, Norfolk. Andalusian.
535 R.N.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield. Langshan.
H.C.—533.

Class 452.—Cockerels, any other distinct variety, except Bantams.

- 543 I.—MAJOR G. T. WILLIAMS, Tredrea, Perranwell. Frizzle.
542 II.—H. HEATE, Pickford P.F., Bakewell. Redcap.

Class 453.—Pullets, any other distinct variety, except Bantams.

- 551 I.—MAJOR G. T. WILLIAMS, Tredrea, Perranwell. Polish.
549 II.—H. HEATE, Pickford P.F., Bakewell. Redcap.
550 III.—ABBOT BROS., Thuxton, Norfolk. Andalusian.
547 IV.—MAJOR G. T. WILLIAMS. Polish.

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Class 455.—White Wyandotte Utility Hens.

- 555 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
558 II.—J. D. BEAK, Malden Bradley, Frome.
557 III.—TOM GARDNER, Bowgreave, Garstang.
556 IV.—EVENDON LODGE PEDIGREE P.F., Wokingham.
558 R.N.—MRS. LIONEL DE ROTHSCHILD, Gatewood Farm, Exbury, Southampton.

Class 456.—White Wyandotte Utility Cockerels.

- 562 I.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
561 II.—WILLIAM HAMNETT, Myrtle P.F., Blackpool.
560 III.—IAN G. DIGBY, The Firs, Ropley, Hants.
563 IV.—J. D. BEAK, Malden Bradley, Frome.

Class 457.—White Wyandotte Utility Pullets.

- 568 I.—WILLIAM HAMNETT, Myrtle P.F., Blackpool.
566 II.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
567 III.—J. D. BEAK, Malden Bradley, Frome.
565 IV.—IAN G. DIGBY, The Firs, Ropley, Hants.

Class 458.—White Leghorn Utility Cocks or Cockerels.

- 574 I.—WILLIAM HAMNETT, Myrtle P.F., Blackpool.
569 II.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
571 III.—TOM GARDNER, Bowgreave, Garstang.
573 IV.—IAN G. DIGBY, The Firs, Ropley, Hants.
572 R.N.—CAPT. E. DUCKWORTH, Corner Heys, Tinsley Green, Crawley.
H.C.—575. C.—570.

Class 459.—White Leghorn Utility Hens or Pullets.

- 576 I.—IAN G. DIGBY, The Firs, Ropley, Hants.
578 II.—WILLIAM HAMNETT, Myrtle P.F., Blackpool.
575 III.—CAPT. E. DUCKWORTH, Corner Heys, Tinsley Green, Crawley.
577 IV.—MRS. E. M. HARE, Pinehurst P.F., West Moors, Wimborne.
580 R.N.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
H.C.—581. C.—588.

Class 460.—Leghorn Utility Cocks or Cockerels, any other colour.

- 586 I.—ERNEST STEVENS, 55, The Oval, Godalming.
583 II.—AUSTEN WALKER, Croxton Park, Grantham.
587 III.—W. G. MILLS, Clay Hill, Lyndhurst, Hants.
585 IV.—J. E. RUBERY, The Shrubbery, Alvechurch, Birmingham.

Class 461.—Leghorn Utility Hens or Pullets, any other colour.

- 589 I.—WILLIAM HAMNETT, Myrtle P.F., Blackpool.
592 II.—RYDER & BERRY, Quarry P.F., Daresbury, Warrington.
591 III.—HARRY FOX, International Poultry Yards, Matlock.
588 IV.—AUSTEN WALKER, Croxton Park, Grantham.
590 R.N.—J. E. RUBERY, The Shrubbery, Alvechurch, Birmingham.

Class 462.—Plymouth Rock Utility Cocks or Cockerels.

- 600 I.—W. W. W. BUTT, Eastfield P.F., North Thoresby, Lincs.
594 II.—MRS. J. H. DREW, Buff Rock P.F., Basingstoke.
596 III.—H. S. DAVIES, Highbury, Llandilo.
597 IV.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.
595 R.N.—WILLIAM HAMNETT, Myrtle P.F., Blackpool.
H.C.—601. C.—598.

Class 463.—Plymouth Rock Utility Hens or Pullets.

- 608 I.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex.
609 II and 602 IV.—MRS. J. H. DREW, Buff Rock P.F., Basingstoke.
606 III.—JOHN TAYLOR, Heath Farm, Tiptree, Essex.
605 R.N.—WILLIAM HAMNETT, Myrtle P.F., Blackpool.
H.C.—607. C.—604.

Class 464.—Rhode Island Red Utility Cocks or Cockerels.

- 618 I. and 609 II.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey.
614 III.—MRS. E. M. HARE, Pinehurst P.F., Westmoors, Wimborne.
621 IV.—J. R. ALLEN, South Street, Dunkirk, Faversham.
614 R.N.—JOHN DARNELL, Sunnymede, Rampton, Retford.
H.C.—610, 612. C.—628.

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Class 465.—*Rhode Island Red Utility Hens or Pullets.*

- 641 I.—CAPT. E. DUCKWORTH, Corner Heys, Tinsley Green, Crawley.
634 II and 628 III.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey.
639 IV.—W. H. L. HURMAN, Gasmere, Banwell, Somerset.
636 R.N.—G. H. MUZZLEWHITE, Redlands, Tavistock.
H.C.—627, 629. C.—630.

Class 466.—*Sussex Utility Cocks or Cockerels.*

- 645 I.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
646 II.—R. ANTHONY, Euxton, Chorley, Lancs.
648 III.—AUSTEN WALKER, Croxton Park, Grantham.
643 IV.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
644 R.N.—CAPT. THE HON. C. K. GREENWAY, Stanbridge Earls P.F., Romsey, Hants.
H.C.—647.

Class 467.—*Sussex Utility Hens or Pullets.*

- 653 I.—CAPT. E. DUCKWORTH, Corner Heys, Tinsley Green, Crawley.
649 II.—JOHN A. DEWAR, Homestall P.F., East Grinstead.
656 III.—SIR GOMER BERRY, BART., Pendley Stock Farms, Tring.
657 IV.—TOM GARDNER, Bowgreave, Garstang.
655 R.N.—J. E. ATHERTON, Kingcott Farm, Flax Bourton, Somerset.
H.C.—651. C.—654.

Class 468.—*Any other variety Utility Light Cocks or Hens.*

- 661 I.—R. ANTHONY, Euxton, Chorley, Lancs. Ancona.
662 II.—HARRY FOX, International Poultry Yards, Matlock, Redcap.
659 III.—WILLIAM HAMNETT, Myrtle P.F., Blackpool. Ancona.
660 IV.—EYENDON LODGE PEDIGREE P.F., Wokingham. Welsummer.

Class 469.—*Any other variety Utility Heavy Cocks or Hens.*

- 670 I.—R. ANTHONY, Euxton, Chorley, Lancs. Croad Langshan.
667 II.—WILLIAM HAMNETT, Myrtle P.F., Blackpool. Barnevelder.
669 III.—TOM GARDNER, Bowgreave, Garstang. Australorp.
673 IV.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex. Barnevelder.
H.C.—668. C.—666.

Class 470.—*Any other variety Utility Cockerels.*

- 676 I.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex. Barnevelder.
675 II.—R. ANTHONY, Euxton, Chorley, Lancs. Croad Langshan.
679 III.—FRED BARKER, The Grange, Menston, Leeds. Orpington.
678 IV.—A. J. MAJOR, Ditton, Langley, Bucks. Dorking.
674 R.N.—MRS. E. K. STAINES, Hook Farm, Leigh, Reigate. Jersey Black Giant.
H.C.—677.

Class 471.—*Any other variety Utility Pullets.*

- 686 I.—NORMAN M. GRANT, Mill Lane P.F., Copthorne, Sussex. Barnevelder.
684 II.—FRED BARKER, The Grange, Menston, Leeds. Orpington.
681 III.—MRS. E. K. STAINES, Hook Farm, Leigh, Reigate. Jersey Black Giant.
682 IV.—A. J. MAJOR, Ditton, Langley, Bucks. Dorking.
683 R.N.—MRS. W. A. REEVES, Norton Ferris, Kilmington, Frome. Bresse.
H.C.—685. C.—687.

Classes 472 and 473 are for birds that have secured Copper Rings, issued by the National Poultry Council, and Exhibits in these two Classes must wear the Copper Ring to be eligible for Competition.

Class 472.—*Utility Light Hens.*

- 689 I. and 692 II.—WILLIAM HAMNETT, Myrtle P.F., Blackpool. Leghorn.
690 III.—MRS. EMILY MILLS, Woodford Hall, Milton Damarel, Devon. Ancona.
691 IV.—MRS. LIONEL DE ROTHSCHILD, Gatewood Farm, Exbury, Southampton. Leghorn.

Class 473.—*Utility Heavy Hens.*

- 697 I. and 694 II.—WILLIAM HAMNETT, Myrtle P.F., Blackpool. Plymouth Rock and Wyandotte.
695 III.—J. D. BEAK, Maiden Bradley, Frome. Wyandotte.
696 IV.—MISS M. V. LARKWORTHY, Cooper's Bridge, Liphook, Hants. Wyandotte.

Class 474.—*Aylesbury, Pekin or Rouen Drakes.*

- 701 I.—R. ANTHONY, Euxton, Chorley, Lancs. Rouen.
699 II.—ABBOT BROS., Thuxton, Norfolk. Rouen.
702 III.—S. SPENKE, Park Farm, Stowting, Ashford, Kent. Rouen.

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Class 475.—Aylesbury, Pekin or Rouen Ducks.

- 706 I.—R. ANTHONY, Euxton, Chorley, Lancs. Rouen.
704 II.—S. SPINKE, Park Farm, Stowting, Ashford, Kent. Rouen.
703 III.—ABBOT BROS., Thuxton, Norfolk. Rouen.
700 IV.—MRS. LIONEL DE ROTHSCHILD, Gatewood Farm, Exbury, Southampton. Aylesbury.

Class 476.—Indian Runner Drakes or Ducks, bred prior to 1932.

- 709 I.—REGINALD APPELEYARD, Priory Waterfowl Farm, Ixworth, Bury St. Edmunds.
714 II.—MRS. W. G. JACKA, Ninnis, Germoe, Marazion.
708 III.—THE REV. J. HEWETSON, Burbage Vicarage, Buxton.
718 IV.—CAPT. C. O'S. CREE, Owermoigne, Dorchester.
715 R.N.—J. HEWITT, Woodbine, Littlethorpe, Ripon.
H.C.—707, 712.

Class 477.—Indian Runner Drakes or Ducks, bred in 1932.

- 728 I.—R. ANTHONY, Euxton, Chorley, Lancs.
720 II. and 725 R.N.—J. HEWITT, Woodbine, Littlethorpe, Ripon.
723 III.—FRED ARGO, Bructor, by Inverurie.
726 IV.—II. WHITLEY, Primley, Paignton.
H.C.—727.

Class 478.—Drakes, any other variety.

- 738 I.—MAJOR L. C. CHAWNER, Little Barrs, New Milton, Hants. Cayuga.
741 II.—H. BARKER, Lodge P.F., Long Eaton, Nottingham. Magpie.
740 III.—R. ANTHONY, Euxton, Chorley, Lancs. Khaki Campbell.
732 IV.—G. CLAPHAM, Bowbrook, Shrewsbury. Muscovy.
H.C.—738, 735. C.—730.

Class 479.—Ducks, any other variety.

- 746 I.—JOHN II. BUTLER, Gatecombe, Flax Bourton, Somerset. Khaki Campbell.
749 II.—IAN G. DIGBY, The Firs, Ropley, Hants. Buff Orpington.
742 III.—J. CARLTON HUNTING, Pankridge Farm, Prestwood, Great Missenden. Carolina.
747 IV.—WM. RICHARDSON, 40, Bootham Crescent, York. Cayuga.
743 R.N.—G. CLAPHAM, Bowbrook, Shrewsbury. Muscovy.
H.C.—750.

Class 480.—Emden Ganders or Geese.

- 752 I. and 757 R.N.—REGINALD APPELEYARD, Priory Waterfowl Farm, Ixworth, Bury St. Edmunds.
756 II.—ABBOT BROS., Thuxton, Norfolk.
753 III. and 754 IV.—CAPT. N. M. HARROP, Garthgynan, Ruthin.

Class 481.—Toulouse Ganders or Geese.

- 760 I.—ABBOT BROS., Thuxton, Norfolk.
761 II.—II. WHITLEY, Primley, Paignton.
759 III.—REGINALD APPELEYARD, Priory Waterfowl Farm, Ixworth, Bury St. Edmunds.
762 IV.—G. H. BARKER, Thorpe Arnold, Melton Mowbray.
763 R.N.—MISS LIONEL DE ROTHSCHILD, Gatewood Farm, Exbury, Southampton.

Class 482.—Turkey Cocks.

- 765 I.—MRS. JESSIE ANDREW, South Tulloford, Old Meldrum, Aberdeen.
767 II.—ABBOT BROS., Thuxton, Norfolk.
763 III.—MRS. LIONEL DE ROTHSCHILD, Gatewood Farm, Exbury, Southampton.
764 IV.—J. CARLTON HUNTING, Pankridge Farm, Prestwood, Great Missenden.

Class 483.—Turkey Hens.

- 771 I. and 773 III.—ABBOT BROS., Thuxton, Norfolk.
769 II.—J. CARLTON HUNTING, Pankridge Farm, Prestwood, Great Missenden.
772 IV.—E. & P. ANLEY, Ferndale P.F., Verandah Lodge, Horley.

Class 484.—Modern Game Bantams Cock or Cockerels.

- 774 I.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield.
779 II.—DR. H. Y. MANSFIELD, Brooklands, Freshwater, Isle of Wight.
780 III.—J. F. ENTWISTLE, Crigglestone Manor, Wakefield.
778 IV.—W. H. W. PARSONS, 65, Albert Street, Rugby.
H.C.—775. C.—776.

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Class 485.—Modern Game Bantam Hens or Pullets.

- 786 I. and 782 IV.—DR. H. Y. MANSFIELD, Brooklands, Freshwater, Isle of Wight.
 788 II.—J. F. ENTWISTLE, Crigglestone Manor, Wakefield.
 784 III.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield.
 H.C.—781. C.—787.

Class 486.—Old English Game Bantam Cocks or Cockerels.

- 791 I.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield.
 789 II. and 795 III.—R. S. MARSDEN, Chatburn, Clitheroe.
 798 IV.—C. BROOKFIELD, Yew Tree, Blakenhall, Nantwich.
 H.C.—794. C.—796.

Class 487.—Old English Game Bantam Hens or Pullets.

- 804 I.—RHYS LLEWELLYN, St. Fagans Court, Glam.
 800 II.—R. S. MARSDEN, Chatburn, Clitheroe.
 799 III.—C. N. BELBIN, Nortonthorpe Hall, Huddersfield.
 802 IV.—C. BROOKFIELD, Yew Tree, Blakenhall, Nantwich.
 H.C.—801. C.—805.

Class 488.—Wyandotte Bantam Cocks or Cockerels.

- 810 I.—J. F. ENTWISTLE, Crigglestone Manor, Wakefield.
 811 II.—ISAAC MURFIN, 121, Nuttall's Park, Ripley, Derby.
 809 III.—MRS. EMILY MILLS, Woodford Hall, Milton Damarel, Devon.
 808 IV.—MRS. FLORENCE SMITH, The White House, The Square, Westbourne, Emsworth.

Class 489.—Wyandotte Bantam Hens or Pullets.

- 817 I.—T. H. SHELTON, The Grove, Cropwell Butler, Nottingham.
 818 II.—J. F. ENTWISTLE, Crigglestone Manor, Wakefield.
 812 III.—J. A. BOARDLEY, Slyne Road, Lancaster.
 814 IV.—JAMES WALLBANK, Belmont, Longridge, Preston.
 H.C.—816. C.—815.

Class 490.—Bantam Cocks or Cockerels, any other variety.

- 828 I.—J. JOHNSON, 54, Moss Lane, Latham, Ormskirk. Indian Game.
 819 II.—JOHN A. DEWAR, Homestall P.F., East Grinstead. Pekin.
 818 III.—MAJOR G. T. WILLIAMS, Tredrea, Perranwell. Japanese.
 825 IV.—H. HOUGH-WATSON, Braystones House, Beckermeth. Japanese.
 H.C.—826. C.—820.

Class 491.—Bantam Hens or Pullets, any other variety.

- 832 I.—MAJOR G. T. WILLIAMS, Tredrea, Perranwell. Japanese.
 830 II.—JOHN A. DEWAR, Homestall P.F., East Grinstead. Pekin.
 833 III.—ROBERT BENNETT, The Butts, Frome. Sebright.
 839 IV.—H. HOUGH-WATSON, Braystones House, Beckermeth. Polish.
 H.C.—834. C.—838.

FARM AND DAIRY PRODUCE OF THE UNITED KINGDOM.

Unless otherwise stated the Prizes in each Class for Butter are as follows :
 First Prize, £4 ; Second Prize, £2 ; Third Prize, £1 ; Fourth Prize, 10s. ;
 Fifth Prize, 5s.

Butter.

Class 492.—Two pounds of Fresh Butter, without any salt, made up in plain pounds, from the milk of Channel Island, Devon or South Devon Cattle and their crosses.

- 17 I.—MISS M. M. VARKER, Fraddam, Gwinear, Hayle.
 6 II.—MRS. A. G. DENNIS, Pulworthy, Highampton, Beaworthy.
 1 III.—HIS MAJESTY THE KING, Sandringham, Norfolk.
 12 IV.—MRS. A. REYNOLDS, Oatwell, Okehampton, Devon.
 9 V.—MISS JOHNSTONE, Trewithen, Grampound Road, Cornwall.
 18 R.N.—MRS. JOHN WAY, West Bridge, Bishopslympton, Devon.
 H.C.—7.

Class 493.—*Two pounds of Fresh Butter, without any salt, made up in plain pounds, from the milk of cattle of any breed or cross other than those mentioned in Class 492.*

- 24 I.—MISS A. M. WARD, Foggathorpe Hall Farm, Selby.
- 25 II.—MISS P. L. MUDD, Slade House, Thornthwaite, Darley, Harrogate.
- 21 III.—CAPT. LIVINGSTONE-LEARMONTH, Fifehead Magdalen, Gillingham, Dorset.
- 22 R.N.—MRS. J. MOGFORD, Overcott, Rose Ash, Barnstaple.

H.C.—20.

Class 494.—*Two pounds of Fresh Butter, slightly salted, made up in plain pounds, from the milk of Channel Island, Devon or South Devon Cattle and their crosses.*

- 27 I.—MRS. E. B. BEER, Puddaven, Totnes.
- 30 II.—MRS. A. G. DENNIS, Pulworthy, Highampton, Beaworthy.
- 44 III.—MRS. JOHN WAY, West Bridge, Bishopsnympton, Devon.
- 34 IV.—MRS. S. HARDING, Trevisa Farm, Summerville, Cornwall.
- 26 V.—MISS T. F. BARTON, MacErin, Medstead, Hants.
- 35 R.N.—MISS JOHNSTONE, Trewithen, Grampond Road, Cornwall.

H.C.—38, 43.

Class 495.—*Two pounds of Fresh Butter, slightly salted, made up in plain pounds, from the milk of cattle of any breed or cross other than those mentioned in Class 494.*

- 46 I.—G. DENNIS, Lower Pulworthy Farm, Highampton, Beaworthy.
- 52 II.—MISS A. M. WARD, Foggathorpe Hall Farm, Selby.
- 51 III.—MISS P. L. MUDD, Slade House, Thornthwaite, Darley, Harrogate.
- 50 R.N.—MRS. J. MOGFORD, Overcott, Rose Ash, Barnstaple.

H.C.—47, 49.

Class 496.—*Three pounds of Fresh Butter, slightly salted, made up in pounds in the most attractive marketable designs.*

- 62 I.—MRS. JOHN WAY, West Bridge, Bishopsnympton, Devon.
- 61 II.—MISS P. L. MUDD, Slade House, Thornthwaite, Darley, Harrogate.
- 58 III.—MISS JOHNSTONE, Trewithen, Grampond Road, Cornwall.
- 59 IV.—MRS. J. MOGFORD, Overcott, Rose Ash, Barnstaple.
- 54 R.N.—MRS. E. B. BEER, Puddaven, Totnes.

H.C.—53, 56, 57, 60.

Cheese.

Made in 1932.

Unless otherwise stated the Prizes in each Class for Cheese are as follows:
First Prize, 25; Second Prize, 23; Third Prize, 22.

Class 497.—*Two Cheshire Cheeses, coloured, not less than 40 lb. each.*

- 68 I.—W. E. BLAKE, Cross Lanes, Bickley, Malpas.
- 64 II.—OLIVER HESKETH, Cholmondeston, Winsford.
- 66 III.—A. E. WALLEY, Bickerton Hall, Malpas.
- 65 R.N.—FRED HUNTBACH, Moor Hall, Aston, Nantwich.

H.C.—67.

Class 498.—*Two Cheshire Cheeses, uncoloured, not less than 40 lb. each.*

- 70 I.—FRED HUNTBACH, Moor Hall, Aston, Nantwich.
- 76 II.—OLIVER HESKETH, Cholmondeston, Winsford.
- 72 III.—THOMAS W. YOUNG, Sicilly Oak Farm, Cholmondeley, Malpas.
- 68 R.N.—W. E. BLAKE, Cross Lanes, Bickley, Malpas.

H.C.—71.

Class 499.—*Two Cheddar Cheeses, not less than 50 lb. each.*

- 78 I.—B. H. J. W. WHITE, Hill View Farm, Bruton.
- 76 II.—FRANK PORTCH, Leigh Farm, Wincanton.
- 75 III.—H. H. PICKFORD, Patney, Devizes.
- 79 R.N.—SIDNEY T. WHITE, Sock Dennis Farm, Ilchester.

Class 500.—Two Cheddar Truckles.

- 83 I.—A. H. HUNT, Dropping Lane Farm, Bruton.
 86 II.—FRANK PORTCH, Leigh Farm, Wincanton.
 88 III.—B. H. J. W. WHITE, Hill View Farm, Bruton.
 81 R.N.—W. J. EMERY, Swallowpits Farm, Emborough, Bath.

Class 501.—Two Gloucestershire Cheeses.

- 98 I.—MRS. WILLIAM HAINE, Rectory Farm, Slimbridge.
 92 II.—CHEDDAR VALLEY DAIRY CO., LTD., Rooksbridge, Axbridge.
 91 III.—BRITISH DAIRY INSTITUTE, The University, Reading.
 95 R.N.—JOHN TAYLOR, White House Farm, Earthcott, Alveston, Bristol.

Class 502.—Two Wiltshire Cheeses.

- 97 I.—H. H. PICKFORD, Patney, Devizes.
 96 II.—H. C. KNAPMAN, Drove Farm Dairy, Dean, Salisbury.

Class 503.—Two Leicestershire Cheeses.

- 103 I.—FRANCIS W. TOMLINSON, Hall Farm, Uilesthorpe, Rugby.
 99 II.—BRITISH DAIRY INSTITUTE, The University, Reading.
 98 III.—A. J. BOLSHAW, Jugsholme Farm, East Farndon, Market Harborough.
 102 R.N.—P. J. HAYNES, Home Farm, Ashby Parva, Rugby.

Class 504.—Two Stilton Cheeses.

- 111 I.—WILTS UNITED DAIRIES, LTD., Swepstone, Leicester.
 109 II.—WEBSTER & RICHARDSON, Hickling Lodge, Kinoulton, Notts.
 107 III.—TUXFORD & TEBBUTT, LTD., Thorpe End Dairy, Melton Mowbray.
 105 R.N.—LONG CLAWSON DAIRY, LTD., Hose, Melton Mowbray.
 H.C.—104, 108. C.—106, 110.

Class 505.—Two Wensleydale Cheeses, Stilton shape.

- 112 I.—MRS. S. A. HARRIS, Glenusk, Nantyderry.
 114 II.—MISS B. J. MUDD, Aldborough Dairy, Boroughbridge.
 113 III.—MISS RACHEL JAMES, Llanccayo, Usk, Mon.
 115 R.N.—ALFRED ROWNTREE & SONS, The Dairy, Coverham, Middleham.

Class 507.—Two Caerphilly Cheeses.

- 123 I.—MONMOUTHSHIRE AGRICULTURAL INSTITUTE, Usk.
 117 II.—T. J. COLLINGS, Lower Farm, Lymnsham, Weston-super-Mare.
 122 III.—MRS. S. JOHN, Ruthin Farm, Llanlid, Pencoe, Glam.
 116 R.N.—CHEDDAR VALLEY DAIRY CO., LTD., Rooksbridge, Axbridge.

Class 508.—Two Small Cheeses, not exceeding 6 lb. each, of Cheddar or Cheshire character.

- 129 I. (24.)—FRED HUNTBACH, Moor Hall, Aston, Nantwich.
 133 II. (22.)—FRANK PORTCH, Leigh Farm, Wincanton.
 135 III. (21.)—B. H. J. W. WHITE, Hill View Farm, Bruton.
 134 IV. (10s.)—A. E. WALLEY, Bickerton Hall, Malpas.
 128 V. (5s.)—A. H. HUNT, Dropping Lane Farm, Bruton.
 132 R.N.—H. H. PICKFORD, Patney, Devizes.
 H.C.—127, 130. C.—131.

Class 509.—Two Small Cheeses, not exceeding 6 lb. each, of Stilton or Wensleydale character.

- 144 I. (24.)—WEBSTER & RICHARDSON, Hickling Lodge, Kinoulton, Notts.
 140 II. (22.)—LONG CLAWSON DAIRY, LTD., Long Clawson, Melton Mowbray.
 142 III. (21.)—ALFRED ROWNTREE & SONS, The Dairy, Coverham, Middleham.
 139 R.N.—LONG CLAWSON DAIRY, LTD., Hose, Melton Mowbray.
 H.C.—137, 143. C.—141.

Class 510.—Two Soft Cheeses, made from whole milk.

- 154 I. (24.)—FRANCIS W. TOMLINSON, Hall Farm, Uilesthorpe, Rugby.
 149 II. (22.)—MISS RACHEL JAMES, Llanccayo, Usk, Mon.
 152 III. (21.)—MRS. J. W. PANTALL, 8, Widemarsh Street, Hereford.
 153 IV. (10s.)—MISS POPE, Bashley Lodge, New Milton, Hants.
 151 R.N.—MRS. W. O. A. MARSH, Apes Down, Calbourne Road, Newport, Isle of Wight.

Awards of Prizes for Produce at Southampton, 1932. cliii

Class 511.—*Two Cheeses made from cream without the addition of rennet.*

- 155 I. (24).—HIS MAJESTY THE KING, Sandringham, Norfolk.
165 II. (22).—MRS. J. W. PANTALL, 8, Widemarsh Street, Hereford.
163 III. (21).—CAPT. LIVINGSTONE-LEARMONTH, Fifehead Magdalen, Gillingham, Dorset.
158 IV. (10s.).—MRS. H. CROSBY, Auburn House, West Rounton, Northallerton.
157 V. (5s.).—SIR GEORGE A. COOPER, BART., Hursley Park, Winchester.
156 R.N.—MRS. M. COATE, Hill Farm, Yarmouth, Isle of Wight.

Cider.

Unless otherwise stated the Prizes in each Class for Cider are as follows :
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1 ; Fourth Prize, 10s. ;
Fifth Prize, 5s.

Class 512.—*Casks of Cider, not less than 6 gallons, made in 1931 by a bona-fide Farmer.*

- 170 I.—STANLEY J. SHEPPY, Three Bridges, Taunton.
169 II. and 168 III.—H. W. DAVIS, Goldsborough Farm, Sutton Montis, Yeovil.
171 R.N.—G. J. TATCHELL, Southay Farm, East Lambrook, South Petherton, Somerset.

Class 513.—*Six Bottles of Dry Cider, made in 1931.*

- 180 I.—G. J. TATCHELL, Southay Farm, East Lambrook, South Petherton, Somerset.
179 II.—STYLE & WINCH, The Cyder Works, Dover Place, Ashford, Kent.
172 III.—ANDREW FORD, White House, Newent, Glos.
178 R.N.—SEVERN VALE CIDER CO., LTD., Bushley, Tewkesbury.

Class 514.—*Six Bottles of Sweet Cider, made in 1931.*

- 186 I.—H. W. DAVIS, Goldsborough Farm, Sutton Montis, Yeovil.
199 II.—STANLEY J. SHEPPY, Three Bridges, Taunton.
182 III.—SIR JOHN H. AMORY, BART., Knighthayes Court, Tiverton.
195 IV.—PULLIN BROS., Spanlorum Farm, Compton Greenfield, Bristol.
181 V.—HENRY M. LANG & Co., Hambridge Brewery, Curry Rivel, Somerset.
197 R.N.—SEVERN VALE CIDER CO., LTD., Bushley, Tewkesbury.
H.C.—208.

Class 515.—*Six Bottles of Cider, made previous to 1931.*

- 218 I.—STANLEY J. SHEPPY, Three Bridges, Taunton.
210 II.—MITCHELL TOMS & Co., LTD., Chard, Somerset.
208 III.—LT.-COMDR. K. C. HELYAR, D.S.O., R.N., Poundisford Lodge, Taunton.
204 IV. and 205 R.N.—SIR JOHN H. AMORY, BART., Knighthayes Court, Tiverton.

Wool.¹

Of 1932 clip.

First Prize, £3 ; Second Prize, £2 ; Third Prize, £1, in each Class.

Class 516.—*Three Fleeces of Oxford Down Wool.*

- 217 I. and 216 II.—H. W. STILGOE, The Grounds, Adderbury, Banbury.
215 III.—LAWRENCE B. AKERS, Litchfield Farm, Enstone, Oxford.

Class 517.—*Three Fleeces of Shropshire Wool.*

- 220 I.—E. CRAIG TANNER, Eyton-on-Severn, Wroxeter, Shrewsbury.
219 II.—JOHN MINTON, Dryton, Wroxeter, Shrewsbury.
213 III.—WILLIAM EVERALL, Shrawardine Castle, Shrewsbury.

Class 518.—*Three Fleeces of Southdown Wool.*

- 221 I. and 222 II.—HIS MAJESTY THE KING, Sandringham, Norfolk.
226 III. and 225 R.N.—J. PIERPONT MORGAN, Wall Hall, Watford.
H.C.—227.

¹ The Second and Third Prizes in these Classes were given by the respective Flock Book Societies.

Class 519.—Three Fleeces of Hampshire Down Wool.

- 231 I. and 232 II.—WILLIAM TODD, Little Ponton Grange, Grantham.
230 III.—MAJOR AND MRS. JERVOISE, Herriard Park, Basingstoke.

Class 520.—Three Fleeces of Suffolk Wool.

- 233 I. and 234 II.—G. S. GRAY, Graces Farm, Martyr Worthy, Winchester.

Class 521.—Three Fleeces of Dorset Down Wool.

- 235 I. & R.N. for Champion,¹ and 236 II.—LEONARD TORY, Turnworth, Blandford.
238 III.—RANDOLPH TORY, Charisworth Manor, Blandford.

Class 522.—Three Fleeces of Dorset Horn Wool.

- 239 I. and 240 II.—ALFRED READ, Lower Farm, Hilton, Blandford.

Class 523.—Three Fleeces of Ryeland Wool.

- 244 I. & Champion¹ and 243 II.—DAVID J. THOMAS, Monachty, Abergavenny.
241 III.—T. W. MONTAGUE PERKINS, Ufton Court, Holme Lacy, Hereford.

Class 524.—Three Fleeces of Kerry Hill (Wales) Wool.

- 245 I.—JOHN T. BEAVAN, Winsbury, Chirbury, Montgomery.
246 II.—JOHN W. OWENS, Woodhouse, Shobdon, Herefordshire.

Class 525.—Three Fleeces of Lincoln Wool.

- 249 I. & R.N. for Champion¹ and 248 III.—MAJOR W. H. RAWNSLEY AND D. F. BROWETT, Well Vale, Alford, and Thornton, Horncastle.
247 II.—CLIFFORD NICHOLSON, Willoughton Manor, Lincoln.

Class 527.—Three Fleeces of Wensleydale Wool.

- 253 I. & Champion.¹—JOHN A. WILLIS, Manor House, Carperby, Yorks.
251 II.—JOHN PERCIVAL, Easthouse, Carperby, Yorks.
250 III.—JOHN W. GREENSIT, Holme-on-Swale, Thirsk.

Class 528.—Three Fleeces of Kent or Romney Marsh Wool, from Rams of any age.

- 256 I.—ASHLEY STEVENS, Davington Hall, Faversham.
254 II.—L. H. & G. W. FINN, The Mall, Faversham.
255 III.—J. EGERTON QUESTED, The Firs, Cheriton, Kent.

Class 529.—Three Fleeces of Kent or Romney Marsh Wool from Ewe Tegs.

- 260 I.—ASHLEY STEVENS, Davington Hall, Faversham.
257 II.—E. W. BAKER, Parsonage Farm, Bekebourne, Canterbury.
258 III.—L. H. & G. W. FINN, The Mall, Faversham.

Class 530.—Three Fleeces of Kent or Romney Marsh Wool, excluding Rams or Ewe Tegs.

- 266 I.—ASHLEY STEVENS, Davington Hall, Faversham.
268 II. and 262 III.—L. H. & G. W. FINN, The Mall, Faversham.
265 R.N.—J. EGERTON QUESTED, The Firs, Cheriton, Kent.

Class 531.—Three Fleeces of Welsh Mountain Wool.

- 269 I.—UNIVERSITY COLLEGE OF NORTH WALES, College Farm, Aber, Caernarvonshire.
268 II.—MAJOR ERIC J. W. PLATT, Madryn Farm, Aber, Caernarvonshire.
270 III.—J. K. WILLIAMSON, Derwen Hall, Corwen.

Class 532.—Three Fleeces of Black Welsh Mountain Wool.

- 274 I. and 273 III.—MRS. JERVOISE, Herriard Park, Basingstoke.
271 II.—MISS J. V. HORN, Woodcote Park, Blackshields, Midlothian.

¹ Special Cash Prize, known as the "Merchants of the Staple of England" Prize, given for the best fleece taken from any short-woolled breed of sheep.

² Special Cash Prize, known as the "Merchants of the Staple of England" Prize, given for the best fleece taken from any long-woolled breed of sheep.

BUTTER-MAKING COMPETITIONS.

Class 1.—*Open to Students who have attended a course at any County Class organised by the Wiltshire, Hampshire and West Sussex County Councils, and who have not won a First or Second Prize at any Show.*

- 3 I. (24.)—MISS KATHLEEN BLAKE, The Hyde Home Farm, Luton.
- 1 II. (23.)—MISS EMILY ABBOTT, Red Rice Dairy, Andover.
- 5 III. (22.)—MISS JOAN BURCHMORE, Woodlings Farm, Whitchurch, Hants.
- 6 IV. (21.)—MISS B. DIRDEN, Farm Institute, Sparsholt, Winchester.
- 4 R.N.—MISS H. N. BENNETT, St. George's Hall, Reading.

Class 2.—*Open to Students who have received not less than one month's instruction at any Dairy School and who have not won a First or Second Prize at the R.A.S.E., London Dairy, Bath and West, Royal Counties, Royal Lancashire or Yorkshire Shows.*

Section A.

- 9 I. (24.)—MISS EMILY ABBOTT, Red Rice Dairy, Andover.
 - 15 II. (23.)—MISS D. BEDELL, Underleigh, Butterleigh, Cullompton.
 - 28 III. (22.)—MISS M. E. DAVIES, Kersford Barton, Bridestowe.
 - 21 IV. (21.)—MISS MARGARET BULL, Somerset Farm Institute, Cannington, Bridgwater.
 - 18 R.N.—MISS KATHLEEN BLAKE, The Hyde Home Farm, Luton.
- H.C.—10, 23, 26, 27, 32. C.—20, 22, 25, 29, 30, 31.

Section B.

- 48 I. (24.)—MISS SYBIL E. JONES, Cwm, Crickhowell.
 - 33 II. (23.)—MISS EILEEN ELLAWAY, Ivy House, Usk, Mon.
 - 49 III. (22.)—MISS MARIE JULIAN, Tredinnick, Duloe, Cornwall.
 - 47 IV. (21.)—MISS E. A. JOHNSTONE, Trewithen, Grampound Road, Cornwall.
 - 50 R.N.—MISS GWENDOLINE D. MATTHEWS, Bowers Farm, Bridstow, Ross-on-Wye.
- H.C.—35, 36, 55. C.—44, 46, 56.

Section C.

- 69 I. (24.)—MISS M. E. SANDERCOCK, Venterdon, Stoke Climsland, Callington, Cornwall.
 - 60 II. (23.)—MISS NANNY M. PAULL, Leyonne, Par, Cornwall.
 - 80 III. (22.)—MISS J. WRIGHT, Farm Institute, Sparsholt, Winchester.
 - 68 IV. (21.)—MISS I. G. ROBERTS, Somerset Farm Institute, Cannington, Bridgwater.
 - 72 R.N.—MISS F. E. SLEEP, Somerset Farm Institute, Cannington, Bridgwater.
- H.C.—63, 67, 76, 77. C.—59, 71, 73, 74.

Class 3.—*Open, except to Champions at the R.A.S.E., London Dairy, Bath and West, Royal Counties, Royal Lancashire or Yorkshire Shows.*

Section A.

- 108 I. (25.)—MISS SYBIL E. JONES, Cwm, Crickhowell.
 - 88 II. (24.)—MISS D. BEDELL, Underleigh, Butterleigh, Cullompton.
 - 95 III. (23.)—MISS EILEEN ELLAWAY, Ivy House, Usk, Mon.
 - 86 IV. (22.)—MISS KATHLEEN COLWILL, The Dingle, Little Witley, Worcester.
 - 110 V. (21.)—MISS A. O. MITCHELL, Penventinnie, Kenwyn, Truro.
 - 98 R.N.—MRS. C. A. HASPEL, Normanton, London Road, Burgess Hill.
- H.C.—92, 100. C.—89, 104.

Section B.

- 111 I. (25.)—MISS H. E. MITCHELL, Penventinnie, Kenwyn, Truro.
 - 117 II. (24.)—MISS P. PEER, Rectory Farm, Tibberton, Dorset.
 - 118 III. (23.)—MISS E. E. PETERS, Tremeneheere, Stithians, Cornwall.
 - 124 IV. (22.)—MISS WINIFRED M. SWEETLAND, Mounthill, Oyston, Devon.
 - 112 V. (21.)—MISS V. I. MITCHEM, Wappingthorne Farm, Stirling.
 - 116 R.N.—MISS NANNY M. PAULL, Leyonne, Par, Cornwall.
- H.C.—120, 128. C.—105, 119.

clvi *Awards of Horticultural Prizes at Southampton, 1932.*

Class 4.—*Inter-County Championship for teams of three, one of whom must be a Novice never having won a First or Second Prize up to the time of entry, the second member must not have won more than three First Prizes and must never have won any Championship, the third member may be a Champion at this or any Show.*

- 133 I. (£3. & Silver Medal each.)—
 { MISS RAY WILLIAMS, The Court Farm, Llantarnam, Newport, Mon.
 MISS MARGARET PROTHERO, Court Farm, Pontypool, Mon.
 MISS EILEEN ELLAWAY, Ivy House, Usk, Mon.
- 129 II. (£2 each.)—
 { MISS M. E. DAVIES, Kersford Barton, Bridestowe, Devon.
 MISS D. BEEDELL, Underleigh, Butterleigh, Cullompton, Devon.
 MISS ROSA HANCOCK, New Barn, Chulmleigh, Devon.
- 128 III. (£1 each.)—
 { MISS E. A. JOHNSTONE, Trewithen, Grampound Road, Cornwall.
 MISS SIDWELL M. STEPHENS, St. Winnow Barton, Lostwithiel.
 MISS H. E. MITCHELL, Penventinnie, Kenwyn, Truro.
- 135 R.N.—
 { MISS MABEL EDWARDS, Walsgrove Farm, Great Witley, Worcester.
 MISS GRACE CULLEN, Lower Court, Cotheridge, Worcester.
 MISS MABEL K. STRATTON, Charlton, Pershore.
- H.C.—131. C.—130.

Class 5.—*Championship restricted to residents in Hampshire and the Isle of Wight who are Prize Winners in the preceding Classes and for First and Second Prize Winners at any Show.*

- 141 I. (£4 & Silver Medal.)—MISS MABEL E. ROUNSEVELL, The Dairy, Hursley Park, Winchester.
- 138 II. (£3.)—MISS ALICE M. DINGLE, Hazelby Dairy, North End, Newbury.
- 9 III. (£2.)—MISS EMILY ABBOTT, Red Rice Dairy, Andover.
- 3 IV. (£1.)—MISS KATHLEEN BLAKE, The Hyde Home Farm, Luton.
- 139 R.N.—MISS MABEL K. DINGLE, Netherhill Farm, Durley, Botley, Hants.
- H.C.—142.

Class 6.—*Championship open to First Prize Winners in the preceding Classes or at any previous R.A.S.E. Show, and to Champions of the London Dairy, Bath and West, Royal Counties, or any County Show.*

- 151 I. (£5 & Gold Medal.)—MISS H. E. MITCHELL, Penventinnie, Kenwyn, Truro.
- 143 II. (£4.)—MISS SYBIL E. JONES, Cwm, Crickhowell.
- 152 III. (£3.)—MISS E. E. PETERS, Tremeneheere, Stithians, Cornwall.
- 144 IV. (£2.)—MISS KATHLEEN DAVIS, Trebudannon, St. Columb, Cornwall.
- 147 V. (£1.)—MISS ROSA HANCOCK, New Barn, Chulmleigh, Devon.
- 155 R.N.—MISS MABEL K. STRATTON, Charlton, Pershore, Worcs.
- H.C.—145. C.—153.

FLOWER SHOW.

Class 1.—Groups of Miscellaneous Plants.

- 1 I. (£45.)—JAMES CYPHER & SONS, Queen's Road Nurseries, Cheltenham.
- 3 II. (£40.)—T. M. PETCH, Highfield Nursery, Great Horton, Bradford.
- 2 III. (£5.)—DEAN NURSERIES, Holdenhurst Road, Bournemouth.

Class 2.—Collection of Delphiniums.

- 4 I. (£6.)—BLACKMORE & LANGDON, Bath.
- 6 II. (£4.)—HEWITT & Co., LTD., Solihull, Birmingham.

Class 3.—Groups of Tuberous Begonias in pots.

- 7 I. (£30.)—BLACKMORE & LANGDON, Bath.

Class 4.—Groups of Aquatic and Semi-Aquatic Plants.

- 10 I. (£20.)—HILLIER & SONS, Winchester.
- 11 II. (£15.)—MAURICE PRICEARD & SONS, LTD., Riverslea Nurseries, Christchurch, Hants.
- 9 III. (£10.)—LT.-COL. C. H. GREY, D.S.O., Hookeredge Gardens, Cranbrook.
- 3 IV. (£2.)—BOWELL & SKARRATT, Hardy Plant Nurseries, Cheltenham.

Awards of Horticultural Prizes at Southampton, 1932. clvii

Class 5.—Collections of Hardy Perennial Plants and Cut Blooms.

- 13 I. (£30.)—BEES, LTD., Sealand Nurseries, Chester.
- 12 II. (£35.)—WILLIAM ARTINDALE & SON, Nether Green, Sheffield.
- 17 III. (£20.)—MAURICE PRICHARD & SONS, LTD., Riverslea Nurseries, Christchurch.
- 18 IV. (£10.)—SUFFOLK SEED STORES, LTD., Woodbridge.
- 16 V. (£5.)—GAYBORDER NURSERIES, Melbourne, Derbyshire.

Class 6.—Collections of Tree Carnations.

- 19 I. (£15 & Cup.¹)—C. ENGELMANN, LTD., Saffron Walden.

Class 7.—Collections of Cut Sprays of Tree Carnations.

- 20 I. (£15.)—C. ENGELMANN, LTD., Saffron Walden.
- 21 II. (£10.)—STUART LOW & CO., Bush Hill Park, Enfield.

Class 8.—Collections of Cut Sprays of Border Carnations.

- 22 I. (£15.)—HORACE LAKEMAN, Queensberry Nursery, Thornton Heath.

Class 9.—Collections of Sweet Peas.

- 23 I. (£15.)—RALPH CHALLINOR, Bell Farm, Balterley, Crewe.

Class 10.—Collections of Cut Roses.

- 25 I. (£15.)—JOHN WATERER, SONS & CRISP, LTD., The Floral Mile, Twyford, Berks.
- 24 II. (£10.)—FRANK CANT & CO., Braiswick Rose Gardens, Colchester.
- 26 III. (£7.)—WHEATCROFT BROS., Gedling, Nottingham.

Exhibits not for Competition.

Large Gold Medals to :—

- 27 ALLWOOD BROS., Wivelsfield Nurseries, Haywards Heath. Carnations, Allwood II and Pinks.
- 28 BAKERS, Codsall, Wolverhampton. Delphiniums.
- 38 CONWAYS, LTD., Halifax. Rock and Water Garden.
- 56 ALEX DICKSON & SONS, LTD., Hawlmark, Newtownards, Ireland. Roses.
- 34 STUDLEY COLLEGE, Warwickshire. Fruit and Vegetables.
- 55 SUTTON & SONS, LTD., Reading. Sweet Peas and Annuals.

Gold Medals to :—

- 41 HORACE LAKEMAN, Queensberry Nursery, Thornton Heath. Cut Border Carnations.
- 43 STUART LOW & CO., Bush Hill Park, Enfield. Orchids, Malmaison and Border Carnations.
- 45 MAXWELL & BEATE, LTD., Hardy Plant Nursery, Broadstone, Dorset. Hardy Heathers.
- 46 MAURICE PRICHARD & SONS, LTD., Riverslea Nurseries, Christchurch, Hants. Alpine Plants.
- 50 W. H. ROGERS & SON, LTD., Red Lodge Nursery, Bassett, Southampton. Formal Paved Garden.
- 57 F. GOMER WATERER'S KNAPHILL NURSERY, LTD., Woking. Ornamental Shrubs Lilies, etc.
- 64 HILLIER & SONS, Winchester. Choice Plants.

Silver Gift Medals to :—

- 29 BEES, LTD., Sealand Nurseries, Chester. Delphiniums.
- 31 BENJAMIN R. CANT & SONS, LTD., The Old Rose Gardens, Colchester. Roses.
- 40 B. LADHAMS, LTD., The Shirley Nurseries, 110, High Street, Shirley, Southampton. Rock Garden.
- 42 LAXTON BROS., BEDFORD, LTD., Bedford. Strawberries.
- 51 L. R. RUSSELL, LTD., Richmond Nurseries, Richmond, Surrey. Ornamental Shrubs and Vines.
- 52 STEPHEN SIMS, Draycott, Derbyshire. Rock Garden.
- 58 TOOGOOD & SONS, LTD., Southampton. Floral Display.
- 60 WILLIAM WOOD & SON, LTD., Taplow. Herbaceous and Alpine Plants.

¹ Perpetual Challenge Cup awarded to the First Prize Winner in Class 6.

clviii *Awards of Medals for Implements at Southampton, 1932.*

Silver Medals to :—

- 30 BOWELL & SKARRATT, Hardy Plant Nurseries, Cheltenham. Alpines and Herbaceous Plants.
32 C. G. COLLYER, Everton Nurseries, Lymington, Hants. Rock Garden.
34 DANIELS BROS., LTD., Norwich. Lilliums, Gladiolus, Perennials, etc.
37 G. GIBSON & CO., Leeming Bar, Yorks. Shrubs, Conifers and Flowering Plants.
38 JARMAN & Co., Chard, Somerset. Roses.
39 KELWAY & SON, Langport, Somerset. Delphiniums, Peonies, etc.
44 MADRESFIELD GARDENS, Madresfield, Malvern. Roses and Polyantha.
48 F. RICH, Hindlip Gardens, Worcester. Phlox and other Hardy Flowers.
53 JOHN WATERER, SONS & CRISP, LTD., The Floral Mile, Twyford, Berks. Herbaceous Plants.
61 H. HASKINS & SONS, Branksome Nurseries, Bournemouth. Clematis and Climbing Plants.
63 G. P. PORTER, Alpine Nursery, West Moors, Wimborne. Alpine Plants.

IMPLEMENTS.

Silver Medals for articles entered as "New Implements for Agricultural or Estate Purposes."

- 192 TRANSPLANTERS (HOLDING Co.), LTD., 41, Moorfields, Moorgate, London, E.C.2. Planting Machine.
315 BAMFORDS, LTD., Utttoxeter. Diesel Engine.
309 WILLIAM AITKENHEAD, Brierdale Works, Failsworth, Manchester. Flexible Harrow with renewable tines.

PRINCIPAL ADDITIONS TO THE LIBRARY.

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- AGRICULTURAL ECONOMICS RESEARCH INSTITUTE. Miscellaneous Papers, Vol. 6, 1930-1. Oxford, 1931 *Director*
- "Go East for a Farm": A Study of Rural Migration. By E. Lorrain Smith. Oxford, 1932 *Director*
- "Manufacturing Milk": A Survey of Milk Marketing and Utilization in West Cornwall. By F. J. Prewett. Oxford, 1932 *Director*
- ASTOR, Viscount, and K. A. H. MURRAY. Land and Life: An Economic National Policy for Agriculture. London, 1932 *Purchased*
- BRITISH NATIONAL UNION. Empire Trek Book: The South African Farmers' Visit to Great Britain, 1931 *Union*
- CAMBRIDGE UNIVERSITY DEPARTMENT OF AGRICULTURE, Farm Economics Branch. Report No. 19: An Economic Survey of Agriculture in the Eastern Counties of England, 1931. July, 1932 *Purchased*
- CANADA YEAR BOOK, 1932 *Dominion Government*
- CLARK, F. E., and L. D. H. WELD. Marketing Agricultural Products in the United States. New York, 1932 *Publishers*
- DARLINGTON, C. D., Chromosomes and Plant Breeding. London, 1932 *Publishers*
- DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. Report of the Forest Products Research Board, 1930 *Board*
- EMPIRE MARKETING BOARD. Dairy Produce Supplies in 1931. Prepared in the Statistics and Intelligence Branch of the Board. June, 1932
- Further Changes in the Demand for Butter July, 1928, and July, 1931. Report of an Investigation by the Economic Section of the Board into the Retail Marketing of Butter in Nottingham. March, 1932.
- Imperial Sugar Cane Research Conference, London, 1931. Report of Proceedings. January, 1932.
- Milk Price Margins: A Report on the Difference between Producers' Prices, Wholesale Prices and Retail Prices of Liquid Milk in certain large Cities in different Countries. By R. B. Forrester. June, 1932.
- Report on Cattle Breeding in Jamaica and Trinidad. By J. Hammond. August, 1932.
- Wool Survey: A Summary of Production and Trade in the Empire and Foreign Countries. July, 1932 *Board*
- FORDHAM, MONTAGUE. Britain's Trade and Agriculture: Their recent Evolution and Future Development. (With Preface by the Earl of Radnor.) London, 1932 *Purchased*
- HAMMOND, JOHN. Growth and the Development of Mutton Qualities in the Sheep. A Survey of the Problems involved in Meat Production. Edinburgh, 1932 *Purchased*
- HANNAH DAIRY RESEARCH INSTITUTE. Bulletins: No. 3, The Properties of Milk in relation to the Condensing and Drying of Whole Milk, Separated Milk and Whey. A Review of existing Knowledge. By L. A. Allen, 1932; No. 4, The Engineering Aspects of the Condensing and Drying of Milk. By A. W. Scott. 1932.
- Report for the two years ending March 31, 1932 *Institute*
- INTERNATIONAL INSTITUTE OF AGRICULTURE. The Agricultural Situation in 1930-31. Rome, 1932 *Institute*

- JOURNAL OF AGRICULTURAL SCIENCE, Vol. 21, 1931 *Purchased*
- KEEBLE, Sir FREDERICK. Fertilisers and Food Production on Arable and Grass Land. Oxford, 1932 *Publishers*
- KILM, O. M. The New Agriculture. New York, 1932 *Publishers*
- LEITCH, R. H. Cheddar Cheese-making. Glasgow, 1932 *Purchased*
- McDOUGALL, J. B. Angoras in Colonies: A New Phase in Rabbit Culture. Aylesford, 1932 *Author*
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